

YALE MEDICAL LIBRARY



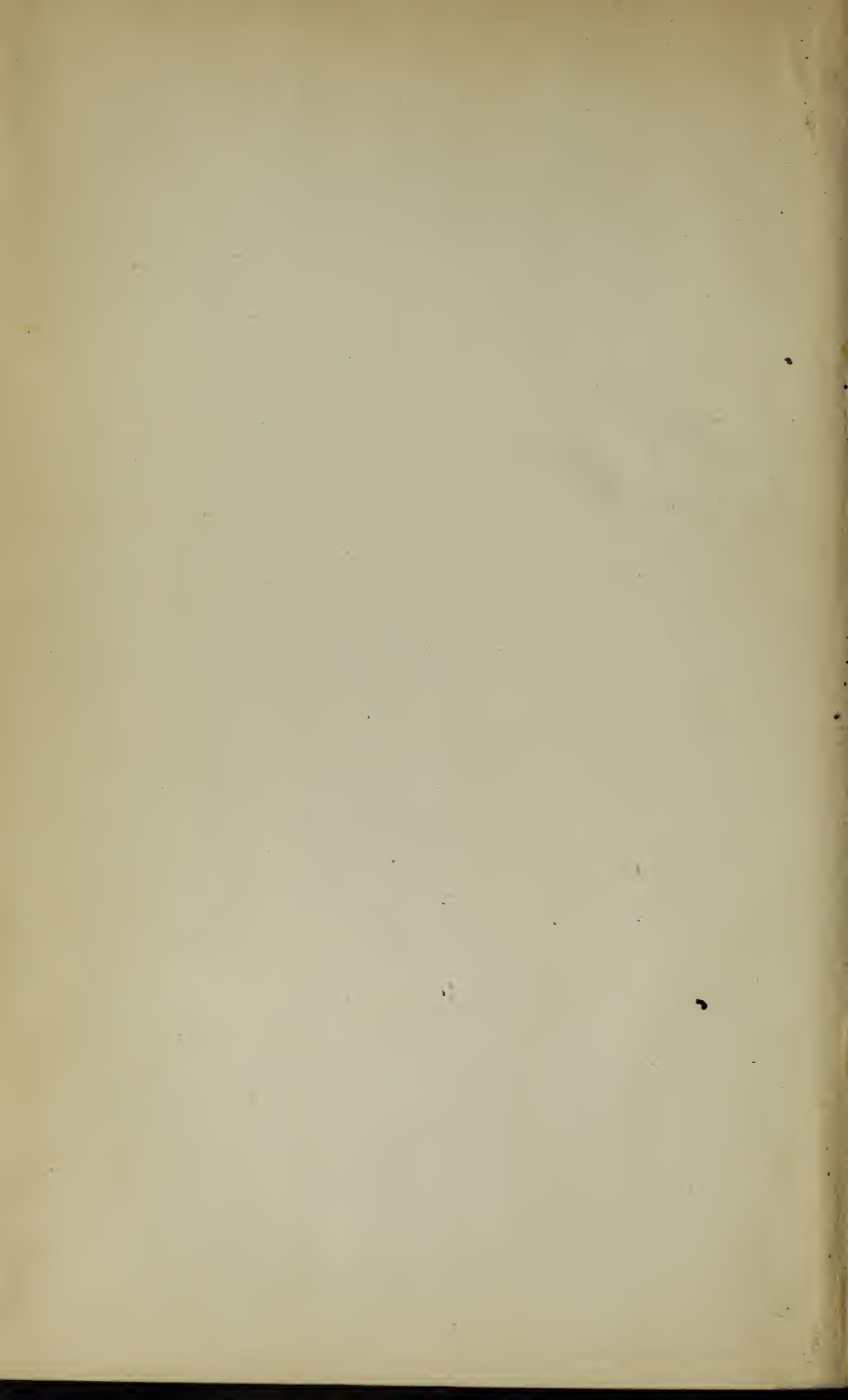
3 9002 07959 4488



YALE UNIVERSITY
LIBRARY



LIBRARY OF
THE SCHOOL OF
MEDICINE



THE

DENTAL COSMOS:

A

MONTHLY RECORD OF DENTAL SCIENCE.

Devoted to the Interests of the Profession.

EDITED BY

JAMES W. WHITE, M.D., D.D.S.

Observe, Compare, Reflect, Record.

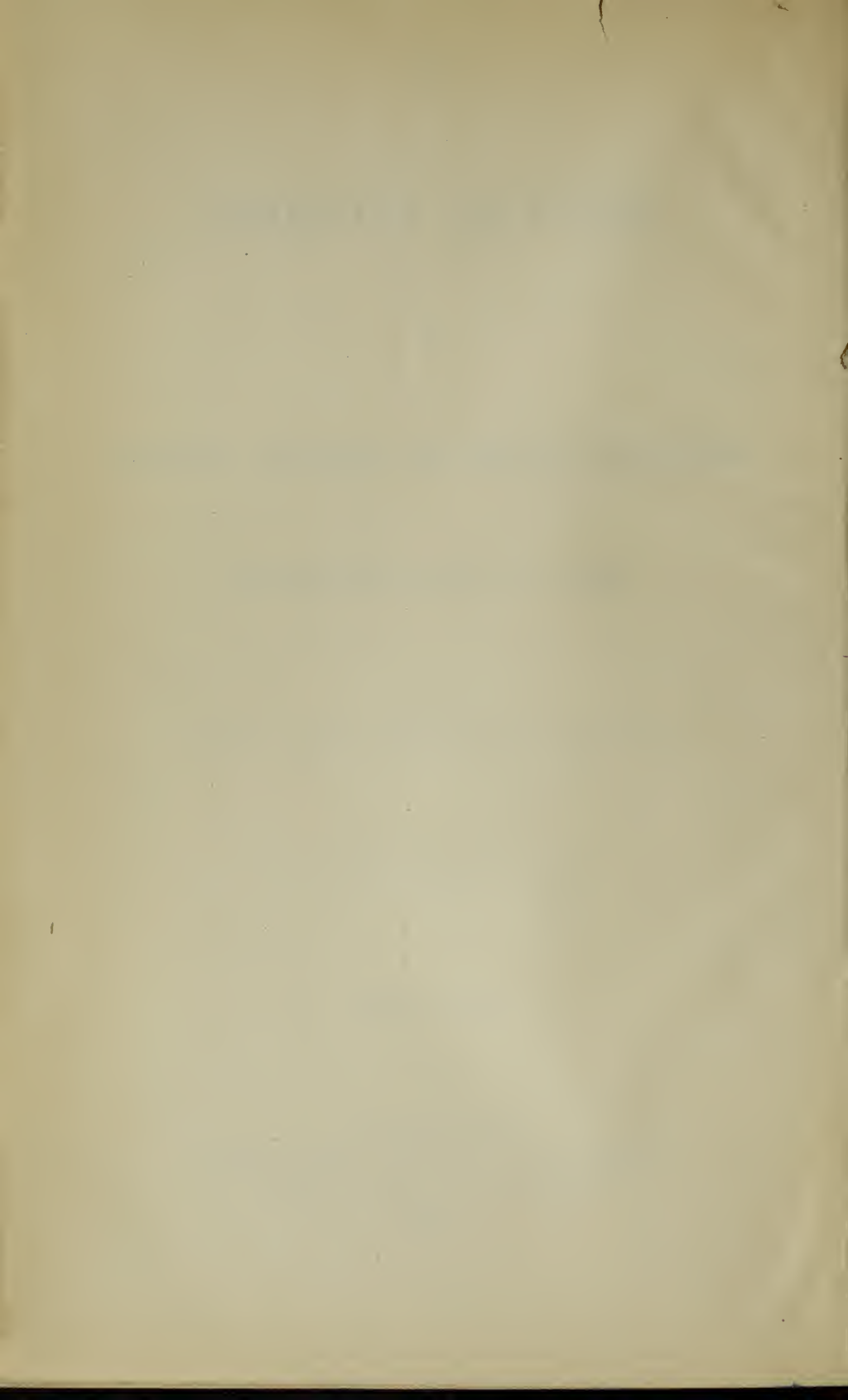
VOL. XVIII.

PHILADELPHIA:

SAMUEL S. WHITE, PUBLISHER,

CHESTNUT STREET, CORNER OF TWELFTH.

1876.



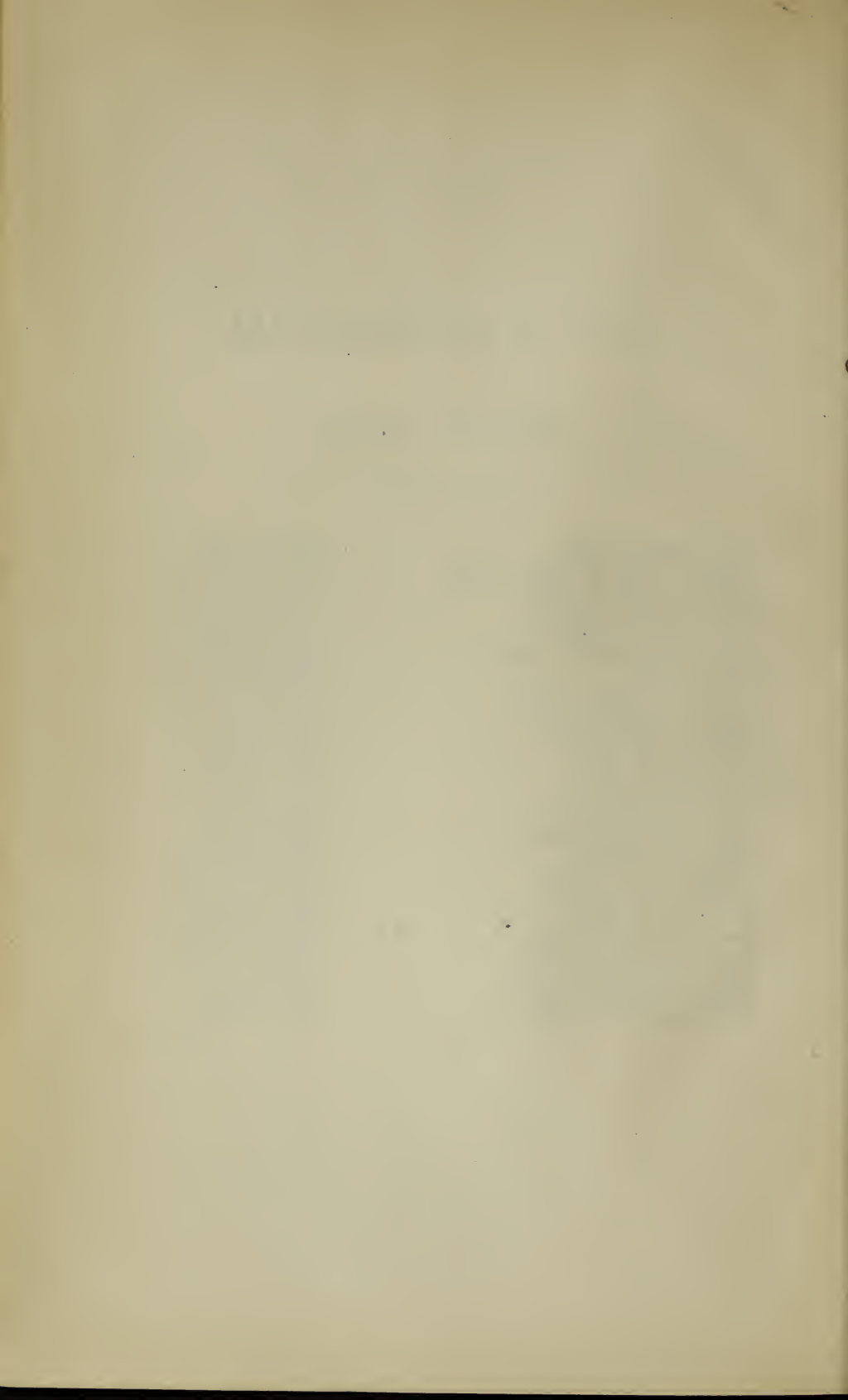
LIST OF CONTRIBUTORS

TO

VOLUME XVIII.

Arthur, Robert, M.D.	Baltimore, Md.
Atkinson, Wm. H., M.D., D.D.S.	New York, N. Y.
Barker, George T., D.D.S.	Philadelphia, Pa.
Chase, Henry S., M.D.	St. Louis, Mo.
Chupein, Theodore F., D.D.S.	Philadelphia, Pa.
Dixon, F. M.	Philadelphia, Pa.
Farrar, J. N., M.D., D.D.S.	Brooklyn, N. Y.
Flagg, J. Foster, D.D.S.	Philadelphia, Pa.
Foster, E. W., M.D.	Boston, Mass.
Francis, C. E., D.D.S.	New York, N. Y.
Horne, W. C., D.D.S.	Rome, Italy.
Noel, L. G., M.D., D.D.S.	Nashville, Tenn.
Peirce, C. N., D.D.S.	Philadelphia, Pa.
Rederich, A. J., D.D.S.	Sioux City, Iowa.
Schibbye, W., D.D.S.	Quito, Ecuador.
Thompson, A. H., D.D.S.	Topeka, Kansas.
Wadsworth, H. N., D.D.S.	Washington, D. C.
Webb, Marshall H., D.D.S.	Lancaster, Pa.
Williams, Jacob L., M.D.	Boston, Mass.

(iii)



CONTENTS OF VOL. XVIII.

ORIGINAL COMMUNICATIONS.

Alveolar Abscess, Radical Treatment of.....	582	Modifying the Masticating Apparatus of Animals, the Potency of Food in.....	399
Chupei's (Dr.) Answer to Dr. Webb	570	Necrosis and Caries—Formation of Pus—Inflammation Defined.....	75
Corrective Treatment of Carious Teeth Preparatory to Permanent Filling.....	179	Operative Dentistry.....	79
Dental Education.....6, 24, 62, 509, 566		Operative Dentistry—a Reply to Dr. Chupei's Remarks on	342
Dental Education—A Reply to Robert Arthur, M.D.....	181	Operative Dentistry, Remarks on...	238
Dental Pathology and Therapeutics.....1, 57, 113, 169, 225, 281, 337, 393, 505, 561, 617		Oral Surgery, Cases of, in Dental Practice.....	28
Dynamics of Dental Occlusion and the Structural Expenditure of Their Maintenance.....	174	Oxychloride of Zinc.....	295
Education.....	302	Phases of Professional Development.....	349, 406, 449
Facial Neuralgia.....	69	Physiological and Pathological Changes in Animal Tissues in Regulating Teeth, an Inquiry into.....	13
Inferior Dental Nerve, Removal of, for Neuralgia.....	243	Resetting and Transplanting Teeth	577
Man and His Teeth.....	230, 286	Tin-Foil as a Material for Filling..	454
		What shall we Fill Teeth with?...	352

PROCEEDINGS OF DENTAL SOCIETIES.

American Academy of Dental Science.....	96, 435, 612	First Judicial District Dental Society.....	148, 432, 488
American Dental Association....	91, 371, 476, 527, 595, 634	Georgia State Dental Society....	263, 615
American Dental Convention, 372, 435, 534, 601, 642		Harvard University, Dental Department of.....	206
Baltimore College of Dental Surgery.....	202	Illinois State Dental Society.....	262
Baltimore College of Dental Surgery, Alumni Meeting.....	262	Indiana State Dental Society.....	322
Baltimore College of Dental Surgery, to the Alumni of the.....	97	Iowa State Dental Society.....	155
Baltimore Dental Society.....	322	Kansas State Dental Association	263, 372
Boston Dental College.....	207	Kentucky State Dental Society.....	323
Brooklyn Dental Society.....	614	Maryland and District of Columbia, Dental Society of.....	488
California State Dental Association	323	Maryland Dental College.....	205
Connecticut Valley Dental Society	263, 322, 550, 661	Maryland Dental College, Dental Alumni Association of.....	202
Correction.....	436, 662	Massachusetts Dental Society....	96, 322
Eastern Indiana Dental Association.....	263	Merrimack Valley Dental Association.....	31, 614
Fifth District Dental Society.....	373	Mississippi State Dental Association.....	613
		Missouri Dental College.....	207
		Missouri State Dental Association..	321

Missouri Valley Dental Society.....	549	Ohio College of Dental Surgery.....	203
New Jersey State Dental Society	322, 373	Ontario Dental Society.....	372
New Orleans College of Dental Surgery.....	206	Pennsylvania College of Dental Surgery.....	203
New York College of Dentistry.....	206	Pennsylvania State Dental Society	322, 484, 539, 608, 645
New York Odontological Society	118, 187, 244, 307, 354, 411, 459, 514, 584, 622	Pennsylvania State Examining Board.....	662
North Carolina State Dental Association.....	488	Philadelphia Dental College.....	204
Odontographic Society of Pennsylvania.....	92, 373	South Carolina State Dental Association.....	436
		Southern Dental Association.....	97
		Susquehanna Dental Association...	614

CLINICAL REPORTS.

Philadelphia Dental College—Service of Prof. James E. Garretson.....	185
CORRESPONDENCE.....	550

EDITORIAL.

An Act to Regulate the Practice of Dentistry in the State of Pennsylvania.....	324	Pennsylvania State Examining Board.....	558
A New Dental Organization in England.....	263	Personal.....	33, 209, 326, 375, 437
An Explanation and Retraction.....	264	Report on Dental Literature, the.....	556
Annual Convocations, the.....	374, 436	Rubber vs. Celluloid.....	99
Conservative Dentistry.....	323	Temperament in the Treatment of Teeth.....	209
Crowded Out.....	557	To Readers and Contributors.....	616
Ethics of Journalism.....	98, 155, 374, 437	To the Dental Profession.....	208
Pennsylvania College of Dental Surgery.....	557	Vernon Galbray.....	99

BIBLIOGRAPHICAL.

Body (the) and its Ailments.....	267	tal Association and Pennsylvania State Dental Society.....	209
History of Dental and Oral Science in America, a.....	491	Student's Guide to Dental Anatomy and Surgery, the.....	265
Micro-Photographs in Histology...	558	Transactions of the Ohio State Dental Society.....	266
Proceedings of the American Den-			

OBITUARY.

Brockway, Dr. L. E.....	616	Robbins, Dr. Edward W.....	490
Brown, Solyman.....	326	Tourtlotte, Jos. N., M.D.....	32
Morrison, Dr. A. W.....	32	Wildman, Elias, M.D., D.D.S.....	489

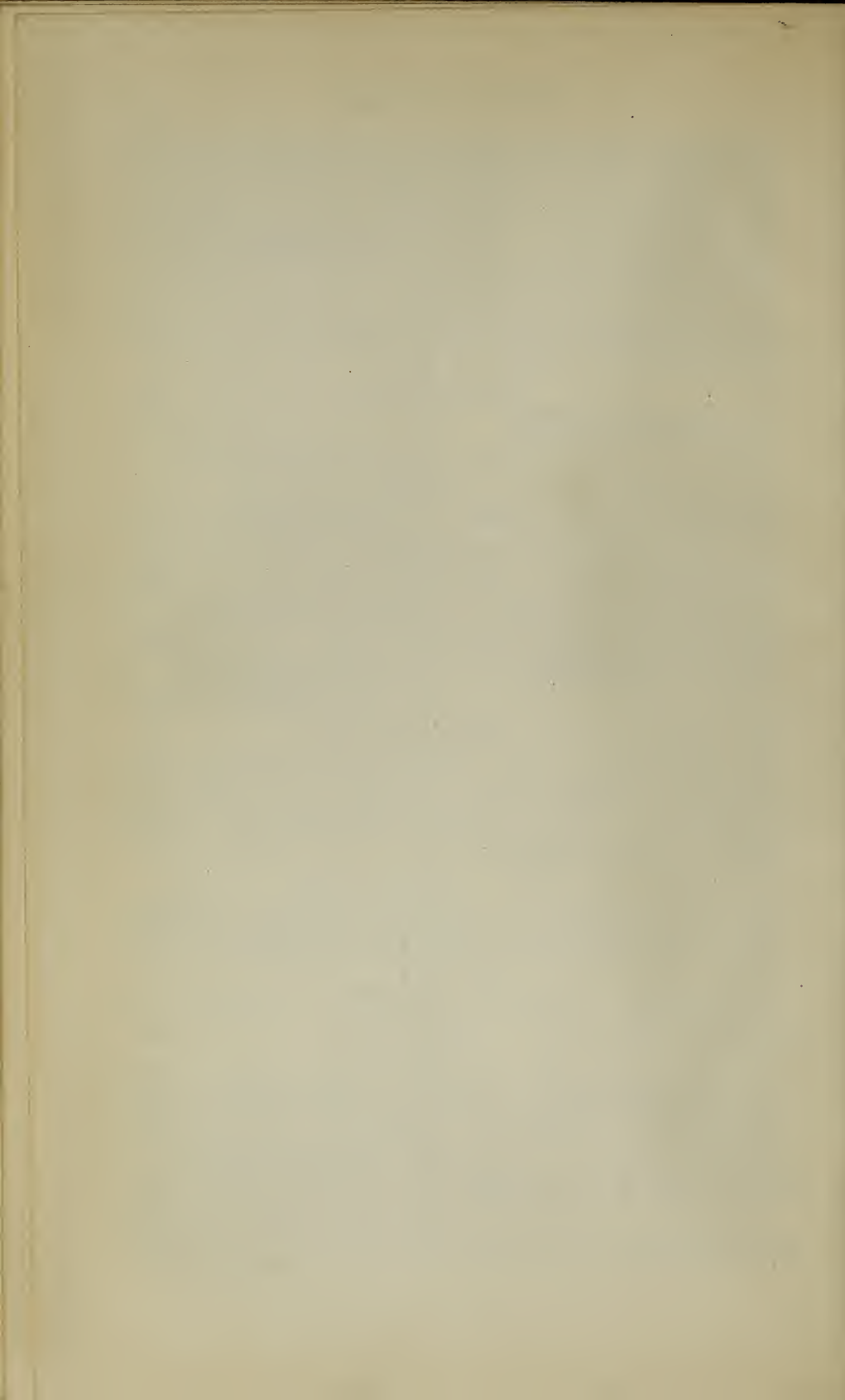
PUBLISHER'S NOTICE.

Close of the Volume.....	663	The New Volume.....	33
--------------------------	-----	---------------------	----

PERISCOPE.

Anæsthesia, Modern, History of....	330	Anti-Neuralgic Properties of the Essence of Mint.....	164
Anæsthesia (Surgical) in Children.	164	Aromatic Sulphuric Acid, the Use of, in Necrosis.....	666
Anæsthesia, The Discoverer of.....	328	Artificial Teeth removed from the Trachea.....	443
Anæsthetics, Dental, and Dental Surgeons.....	380, 665	Asphyxia, a Speedy Method in.....	47
Anæsthetics, Dental, and Heart-Disease... 376, 377, 378, 379, 495, 496,	498	Association of Legally Qualified Dental Surgeons.....	269
Anæsthetics in Extraction of Teeth, the Use of.....	106	Association of Surgeons Practicing Dentistry, the.....	382
Anæsthetics, the Employment of, in Dentistry.....	223		

Awakening in Dentistry, the.....	327	Nerve-Pulp, the Dental, in Life and	
Bogus Diplomas.....	667	Death.....	215
Caries, Dental.....	212	Neuralgia, Gelsemium Sempervirens in.....	222
Carious Teeth.....	165	Neuralgia, Intense and Chronic—	
Case in Practice, a.....	164	Operation—Recovery.....	44
Cement.....	165	Nitrite of Amyl, Administration	
Cement (to) Wood and Iron.....	165	of.....	46
Chloroform Again.....	382	Nitrite of Amyl in Facial Neuralgia.....	45
Chloroform-Asphyxia, how to Prevent.....	163	Odontological Society, the Functions of the.....	272
Chloroform, Death from.....	382	Organization among Dentists, a New.....	268
Compulsory Registration of Dentists.....	103, 104	Organization, the New Dental.....	330
Dental Profession, the.....	105, 268, 271, 494	Osteo-Sarcoma of the Superior Maxilla.....	162
Dental Pulp, on the Treatment of the, when Exposed by Disease, and of Dead and Discharging Teeth.....	218	Partial Necrosis (Superficial) of the Hard Palate, Produced by Pressure from a Rubber Plate.....	40
Dental Pulp, the Conservative Treatment of the.....	383	Periodontitis, Decomposition of the Dental Pulp the Cause of.....	217
Dental Surgery.....	492	Pivoting, On a Method of.....	39
Dental Surgery, an Interesting Case in.....	220	Pivot Teeth.....	37
Dental Surgery, the Scope of.....	156	Progress of Dentistry, the.....	276
Dentigerous Cysts.....	500	Progress, Real.....	274
Dentists and Surgeons Practicing Dentistry.....	271	Ranula Salivalis (Simple), Successful Treatment of, by Probing.....	384
Depressed Cicatrices, Obliteration of	108	Reform, Dental.....	270, 275
Dyspnœa from the Dropping of a Molar Tooth into the Trachea....	223	Removing a Part of the Inferior Dental Nerve within the Lower Jaw, an Easy Method of.....	48
Education of Dentists, the Professional.....	102	Salicylic Acid, on the Action of.....	50
English Hospitals, Observations in	109	Saliva, the Action of.....	165
Ether, Death from.....	46	Salivary Calculus.....	42
Ether, the Advantages of, over Chloroform.....	108	Salivary Fistula, Radical Cure of... ..	499
Exfoliation of the Socket of a Tooth, Case of.....	41	Second Dentition and its Accompaniments.....	34
Exposed Pulp.....	35	Society, New Dental.....	268
Extraction of Teeth under Chloroform.....	107, 108	Society of Dental Surgeons, the New.....	273
Facial Neuralgia, Nitrite of Amyl in.....	45	Society of Surgeons Practicing Dental Surgery, the.....	330
Facial Paralysis, Diagnosis of the Lesions in.....	48	Society, the New Dental.....	269, 270
Gelsemium Sempervirens in Neuralgia.....	222	Swallowing Artificial Teeth.....	331, 385
Gum Lancet, When is the Use of Really Indicated?.....	440, 441, 442	Swallowing of False Teeth.....	386
Hemorrhage, Alveolar.....	385	Syphilis, Manifestations of, in the Teeth.....	437
Hemorrhage following Tooth-Extraction.....	42	Syphilitic Affection of the Sublingual Gland.....	221
Hemorrhage from the Gums—Treatment by Electrolysis.....	163	Syphilitic Teeth.....	663
Imperfect Mastication as a Cause of Diarrhœa.....	667	Third Dentition at the Age of Seventy-Three.....	165
Interrupted Development of a Tooth-Germ.....	42	Toothache.....	321
Iodoform.....	222	Trans- and Replantation of Teeth... ..	442
Mucilage, a New.....	165, 331	Tubercular Lupus of the Tongue and Mouth.....	162
		Tumors of the Superior Maxilla, Statistical Review of Operations for.....	49
		Why may not the Dentist Advertise?.....	106



THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, JANUARY, 1876.

No. 1.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

(Continued from page 621 of vol. xvii.)

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

AT this period of our discussion it seems all-important that too rapid progress from step to step should not be indulged in, and, recognizing this to be one of the most interesting, and possibly the most interesting and important part of dental pathology, the inclination to proceed too cautiously, and with too much minutiae, is almost irresistible.

In my case-book I divide the various stages of decay, between that which I have called deep, and the absolute exposure of a pulp, or its equivalent pathological condition, viz., dead dentine touching the pulp, into three classes,—

- I. Very deep decay.
- II. Near pulp.
- III. Almost-exposed pulp.

Each condition requiring some modification of treatment, and possessing individual peculiarities demanding attention, and necessitating that subtle recognition of the indications pertaining to each case which a thorough apprehension of general principles alone can give.

It must always be remembered, indeed, it should be known intuitively, that "deep decay" is a condition which, in the irritable and non-recuperative tooth of the nervo-lymphatic temperament, would call for all the care and skill that need be exercised for an "almost-exposed pulp" in a nervo-sanguine tooth, and that the comparatively simple "nearness of decay to the pulp" of the bilio-lymphatic temperament is a condition quite comparable to that of "absolute exposure" in the bilio-sanguine.

A careful consideration of these last two paragraphs will not only

show the great extent of matter which a reasonably exhaustive chapter upon these points would require, but it will, I think, afford the *key* which will render it unnecessary.

The psychologico-physiological study of temperamental peculiarities is one which will repay any amount of effort in its prosecution; it is that acquisition which will enable the practitioner to decide at once upon the possibilities of any given case, and which will do most toward the full appreciation of probabilities.

It is the degree of knowledge which is possessed in this connection which harmonizes the strength and length of duration of medicinal or operative application to the diseased condition requiring treatment; it is this knowledge which assures not only the recognition of the possible and probable causes of trouble, but, more than this, which justly estimates the possible and probable power for harm which any irritant may possess, together with the power for good which may be relied upon for aid in any efforts toward healthful restoration.

In a word, diagnosis, therapeutics, and prognosis would seem to be of little worth unless founded upon the broad base of temperamental attributes; and inversely, I would assert, that, other things being equal, just in proportion as the capability and exertion of the student are rewarded by the breadth and solidity of his professional attainments in this direction, so will his practice be the guarantee of large preponderance of success.

It seems to me that I have referred to average "deep decay" with sufficient minuteness for all practical purposes, and that it will now readily be appreciated that in proportion to the progress of caries toward "nearness" to pulp-structure, every indication must, necessarily, be more accurately recognized and provided for.

But when, in any instance, a diagnosis of "almost-exposed pulp" is made, we then have that condition for treatment, which, I think, will be generally admitted to be the culminating point in dental pathology for the exercise of knowledge, judgment, and skill.

Until this period of the advance of caries, the advantage is decidedly in favor of the practitioner, and against the likelihood of future trouble, *except as the result of failure of the operation, purely from the manipulative standpoint*; but now everything rapidly complicates,—age, temperament, physical condition, sex, occupation, mode of living, place of residence, and thermal and barometric changes, have each and all the most direct action for or against the preservation of the vitality of every almost-exposed pulp.

In regard to age, it must be remembered that the division is here not only that of youth, maturity, and old age, but that each of these divisions is again subdivided into very marked periods of decay and periods of cessation from decay.

I have already spoken of this while upon the subject of caries (see DENTAL COSMOS, September, November, and December, 1873), and would suggest reference to the views there advanced as additional theoretic reason for the practice I now advocate. That "periods" of decay do exist, individually expressed it is true, but capable of a certain degree of generalization, sufficient to be practically advantageous, cannot, I think, be denied. I have observed long and extensively in this direction, and have earnestly endeavored to do so with but one desire, viz., the establishment of the fact, if such existed.

Experience has so confirmed the truth of this, that for many years I have practiced upon it, giving extra attention to teeth during such periods; urging greater frequency of examinations, that measures, preventive of serious trouble, might be taken in season, and thus proving beyond question, by the need for service, which was so apparent, the utility of all this care.

And afterwards, as years rolled on, a change so marked as to seem wonderful would present itself; fillings would maintain that satisfactory integrity which before could not be attained with any amount of patient and careful manipulation; small cavities of decay would cease to increase in size; new cavities would no longer be pronounced with almost every visit; and slight defects in sulci, which before would have needed filling in a few months, have since remained unfilled and unchanged for many years.

To whatever cause all this may be ascribed, it is none the less important that anything which can work such local change should be recognized as possessing potent influence over so nicely-balanced an effort as that of the preservation of the vitality, and conservation of the health, of an almost-exposed dental pulp.

It is, then, but reasonable to suppose, during a decided period of decay, at which time it is theorized that the *vitality* of the individual is expending its energy, in the main, for the conservation of such organs as are essential to being, that the amount of recuperative power resident in the pulps of teeth is so much less than normal as to permit, notably, the destruction of the tooth-tissue which it is their duty to produce and to nourish.

It is for this reason that we cannot, at all times, depend upon the recuperative power of youth to aid us in the emergency which we are discussing, for it may be already taxed to its full ability for response.

Nor can we blindly rely upon the well-known strength of the efforts of maturity, for we have seen that this period of life has its vulnerable seasons, during which the teeth are, for the time, regarded by vitality as non-essential, and as such are left to depend upon their physical characteristics for resistance to disintegrating influences.

Nor, again, must we regard old age as necessarily devoid of ability

to help us in the need of pulp-conservation ; but, in cases of almost-exposed pulps in teeth of comparatively aged patients, we should note the presence or the absence of signs indicating tendency to dental decay, and direct our efforts accordingly.

In this way only can one form a correct estimate of the need for ordinary or extraordinary exertion for the preservation of any given pulp ; and equally by this means can one best judge of the proper aid to be demanded from the patient, whether young, middle-aged, or old.

Temperament.—I have previously so decidedly expressed myself in relation to this consideration, that it will be unnecessary for me to do more, at this point, than give conclusions in regard to its bearing upon this subject, which are the deductions from experience.

Assuming that a first temperamental division into Bilious, Sanguine, Lymphatic, and Nervous is essential as a basal arrangement, and that hereditary transmission has so complicated the characteristics of every individual representative of the human race as to render it impossible that any one should possess such attributes as would permit of assignment to this elementary classification, it will be readily conceded that *binary* combinations would be the simplest forms of temperament which could be studied with practical advantage.

We thus have—

- | | |
|----------------------|---------------------|
| 1. Sanguo-Bilious. | 3. Bilio-Lymphatic. |
| Lymphatico-Bilious. | Sanguo-Lymphatic. |
| Nervo-Bilious. | Nervo-Lymphatic. |
| 2. Bilio-Sanguine. | 4. Bilio-Nervous. |
| Lymphatico-Sanguine. | Sanguo-Nervous. |
| Nervo-Sanguine. | Lymphatico-Nervous. |

Before commenting upon these combinations it is important, however, to state that, although temperamental peculiarities are probably best classified thus for first utilization, it is, nevertheless, seldom that they can be regarded as purely binary.

So complex has the mixture become, that it is apparent to the practiced observer that more or less pronounced admixture of a third component has resulted in such *ternaries* as sanguo-lymphatico-bilious or nervo-bilio-lymphatic.

Still further than this, we frequently meet with those to whom we must accord attributes pertaining to all four of the basal temperaments ; and it becomes, then, an affair of considerable difficulty to correctly decide the degree of influence for good, or for harm, which each would exert upon pathological conditions.

Nevertheless, it will be found by those who possess the intuitive

perception bestowed by the nervous temperament, as illustrated by various nervo-bilious, nervo-sanguine, bilio-nervous, sanguo-nervous, and, to some extent, nervo-lymphatic, individuals, that much benefit may be derived by observation and education in relation to the practical bearing of even these complexities.

In order to render this subject one of practical utility, of especial interest, and of comparatively easy acquisition, it is necessary to so classify it as to give, at first, tangible generalizations, that these may be the stepping-stones which, by experience, shall lead to gradually increasing apprehension; and it is with this object that I propose the following dento-temperamental grouping:

- | | |
|---|--|
| 1. Bilio-Sanguine.
Sanguo-Bilious. | 3. Sanguo-Lymphatic.
Bilio-Nervous.
Sanguo-Nervous.
Lymphatico-Nervous. |
| 2. Lymphatico-Sanguine.
Lymphatico-Bilious.
Nervo-Bilious.
Nervo-Sanguine. | 4. Bilio-Lymphatic.
Nervo-Lymphatic. |

It will be found in practice that, with the few exceptions which are proverbially necessary to prove the rule, the efforts directed toward preservation of the integrity of almost-exposed pulps will be rewarded with success about in proportion as more and more care, patience, and skill are bestowed as we advance from the simplicities which are alone needed by the splendidly-recuperative bilio-sanguine and sanguo-bilious temperaments; through the average satisfaction which is afforded to the care bestowed upon the lymphatico-sanguine, and increasedly on to the nervo-sanguine; into the thickening doubts which, even with extra attention; are recognized as hovering over the pulps from sanguo-lymphatic to lymphatico-nervous; until we have reached the eminently unsatisfactory results which, with all of judgment, all of patience, and all of skill, are more or less *slowly* given us by the *bilio-lymphatic*, and more or less *quickly* by the *nervo-lymphatic*, temperament.

As I have already mentioned (DENTAL COSMOS, August, 1873), the tooth-characteristics which are ascribed to the *bilious* temperament are fixedness in the jaws; density of structure; fullness of development; strength and yellowness of coloring.

To the *sanguine* pertain but little less fixedness; but little less density; much beauty, strength, and translucency; and a rich, light-cream color.

For *lymphatic* peculiarities, we have teeth which are loosely held by jaw-tissue; soft in their structure; dull, waxy, and opaque; usually largely developed, but possessing neither beauty nor strength, and variably pallid in their color.

To the *nervous* temperament is assigned a moderately-firm fixedness of the teeth; a comparative density of structure; good organization; delicate beauty of form, but with lack of solidity; generally great length in proportion to breadth; fine cusps; thin cutting edges; pearly-blue color, and a brilliant transparency.

But we have now to do with far more than these external temperamental attributes; and while we classify, by them, the special tooth in charge, we have further to consider the whole subject of general innervation, circulation, and nutrition, from the dental standpoint.

(To be continued.)

DENTAL EDUCATION.

No. 6.

BY R. ARTHUR, M.D.

I now propose to consider two questions which have become prominent in recent discussions of this subject, viz. :

1st. Is dentistry a specialty of medicine, or do the requirements of a dental practice render important an acquaintance with the general principles of medicine?

2d. Does the present system of dental education in the United States furnish the instruction requisite to entitle dentistry to the position of a medical specialty, or does it furnish the amount of instruction in the general principles of medicine requisite for a thorough dental education?

It may be asked, What is meant by the "general principles of medicine"? It may be said that every one who has given any attention to the subject fully understands what this means. But accurate ideas of even familiar subjects are not common, and it will probably be no waste of time to define what is understood by this phrase.

The great object of medicine is the preservation of the normal condition of the human system. Everything which contributes toward this object is embraced within the limits of medicine. Hygiene is recognized as one of its most important elements. That an "ounce of prevention is worth a pound of cure" is an adage as old as medicine itself.

But disease occurs in spite of all efforts to prevent or avoid it, and disease manifests itself in every portion of the system in a vast variety of forms. The study and treatment of disease, therefore, constitutes the great work of medicine.

The very first step toward the study of disease is to become acquainted with the body in a condition of health. What is known of the structure and functions of the whole system and its various parts constitutes the science of anatomy and physiology, and absolutely necessary, as preliminary to this study, is some acquaintance with physics and chemistry. This is, of course, the basis of medicine, and the

student well acquainted with it is prepared to consider intelligently deviations from a healthy condition of the great and complicated structure he is engaged in studying. He is then prepared to turn his attention to pathology, or the science of disease. This, at least, should be his course of study; but practically, in most of the medical and dental colleges, these subjects are brought to the attention of the student simultaneously. He finds, as he prosecutes this study, that disease may not only affect the whole system, but frequently manifests itself in some particular locality or special organ. It may attack the brain or the heart, the arteries or veins, the nervous centers, or the final distributions of the nerves, or, in fact, any part of the body or its appendages. But it will be found that there are features common to all manifestations of disordered action. This renders necessary a generalization, which is known as "general pathology." The manifestations of disease as a peculiar type, either general or local, as fever, inflammation, neuralgia, traumatic affections, and a number of others almost countless, constitute what is termed special pathology. Of course no one can attempt to treat disease intelligently, no matter how it may be circumscribed, until he has become acquainted with its general and special characteristics. But the sole object of the study of disease is to endeavor to effect its cure, and this renders necessary the study of remedial measures. These may be medicinal, and this renders necessary an acquaintance with this class of remedial agents. *Materia medica* constitutes an important feature of general medicine.

But it is not only necessary to study the physical properties of medicines, but also their effects upon the system.

The treatment of injuries and diseases, requiring operations or manual assistance, forms an important branch of the whole subject.

The above statement will give some idea of what is understood by the "principles of medicine."

Let us now inquire what constitutes a specialty of medicine. Medicine, like other natural sciences, is without limit, and, expanded as it has been by modern research and improvement, has grown beyond the grasp of any single mind. To bring it within the reach of individual capacity a number of subdivisions have been made, and medical men have devoted themselves partially or exclusively to the study of single classes of morbid affections. "But in no instance has the investigation of a special group of diseases been of profit to the science, except so far as those who have devoted themselves to these studies have been well versed in other branches of pathology. Diseases are not confined in their effects to single organs, nor can they be disconnectedly studied."*

* Chomel, "General Pathology."

Many of the specialties of medicine are so designated merely from the fact that in the larger cities some general practitioners give greater attention to the study and treatment of certain classes of diseases than to others. Among these may be named diseases of women and children, of the throat and lungs, the dental, urinary, and reproductive organs, obstetrics, diseases of the nervous system, diseases of the skin. The only division of practice, however,—if dentistry is excepted,—to which exclusively special attention is given, is that which embraces eye and ear diseases. General surgery, between which and what is understood as “medicine” a broad distinction exists, is not, except in comparatively rare instances, practiced exclusively even in the larger cities. Some of the most prominent surgeons in this country have been also practitioners of medicine. Physicians, however, as a general rule, avoid surgical cases of any magnitude, unless they are so situated that they are forced to attend to them.

The ophthalmic surgeon, whom we may take as the strict type of a medical specialist, confines his attention to the eye. This is a special organ of the body, and, in a certain sense, distinct from it. The eye is frequently subjected to very serious operations: important and what would seem to be essential parts are removed; even the whole organ itself may be enucleated, without otherwise injuring the system than by depriving it of an important member. The eye may even be replaced with an artificial partial substitute, which will so far subserve the uses of the natural organ as to obviate a distressing disfiguration. The eye is subject to a number of diseases, and, from its exposed position, to injuries from a variety of causes. Many of these diseases and injuries require operative treatment for their cure or relief. The required operations, from the delicate and complicated structure of the eye, demand long training and practice for the acquirement of the necessary skill for their performance. In addition to those abnormal conditions of the eye rendering operative treatment necessary, there are many affections requiring medical attention merely, either local or general. It may, perhaps, be safe to say that if affections of the eye never required operative treatment, there would be no such specialty as ophthalmic surgery. But, notwithstanding the fact that the eye is made the subject of this special attention, and requires treatment demanding special training, it is in union with the rest of the system; it is affected more or less injuriously, as a consequence of general disordered conditions, and reciprocally exerts, under certain circumstances, an injurious influence upon the general health.

The intimate relation of the eye to the general system, the disorders to which it is subject as a consequence of abnormal general conditions, and the impossibility of comprehending fully the true nature of these disorders if attention is confined to the eye itself, render imperative

the general study of medicine as a part of the education of an ophthalmic surgeon. He is engaged in the treatment of disordered conditions of a part of the human body, and he must study them, as they are governed or influenced by the great general laws of disease, which exert a potent influence upon every portion of the system in which there is any departure from a state of health. While it is a profession distinct in a certain practical sense from medicine, it is inseparable from it, and is, therefore, properly ranked as a specialty of that science.

It may be observed here that while the future ophthalmic surgeon receives his general medical education in the usual way, he does not obtain his special training from this source. He is taught in a general way, in some of the medical schools, the anatomy and physiology of the eye, and the diseases to which it is subject, and may or may not have the opportunity of seeing cases of these diseases, and witnessing the requisite operations; but his training as an operative ophthalmic surgeon must come either from a private practitioner of skill and experience, or from an institution specially devoted to this object.

Now, can it be denied that the teeth stand in the same relation to the system as the eyes? They depend, indeed, for their sensibility and power of motion upon the same nerve which supplies these functions to the eye. Both sets of organs receive blood from the same system of arteries. They are affected with similar, as well as different, diseases; they are subject to inflammation and its consequences, to neuralgia, to atrophy, to hypertrophy, etc. They have similar pathological sympathies. Affections of the eye may extend their influence to the teeth, and diseases of the teeth affecting the eye are common; of such cases there are a large number on record. Disorders of the system, caused directly or indirectly by morbid conditions of the teeth, are frequent. Affections of the teeth are unquestionably, to a great extent, due to, or often influenced by, morbid conditions of the general system.

So far, then, as these connections, both anatomical and pathological, are concerned, the eyes and the teeth stand in precisely the same relation to the general system. It is true that the eye is a more delicate organ; that it is subject to a greater number of diseases and injuries; that its preservation is more important to the economy than that of the teeth, which, when lost, can be replaced so as more perfectly to perform the functions of their natural predecessors; that the remedial treatment required is frequently of the most delicate and difficult character. But the fact still remains that the teeth, as well as the eyes, are portions of the human body, and are equally subject to abnormal conditions themselves, and are equally capable, when affected by disease, of extending morbid influences to adjacent and distant parts, and even to the whole system.

I have not space, in such a paper as this, to refer to dissimilarities

of structure of the two classes of organs referred to, the diseases to which they are subject, or to the remedies applied. It is not, indeed, in any way important to my argument, and is of course sufficiently well understood by those who will read this paper.

What would be thought, at the present day, of the qualifications, as an ophthalmic surgeon, of any one who had not been thoroughly instructed in general medicine? He would not obtain or deserve the confidence of any one capable of judging of the qualifications requisite for such a position if he had devoted himself merely to the study of the anatomy and morbid conditions of the eye, and was trained to perform the operations necessary for the treatment of its diseases. He would, indeed, be unable to comprehend them. No scientific subject can be studied in an isolated manner; an intimate connection exists between all branches of knowledge. It is true that no one individual can study every science, but he must give a certain amount of attention to such as are required to throw light upon his special subject of research, if it would otherwise be imperfectly understood. So it is with diseases of all particular organs of the human system. All its parts are so intimately connected in physiological and pathological relations that there can be no limitations, except those of human capacity, upon the study of these general principles of disease involved in its special manifestations.

This view is as strictly applicable to the teeth as to the eye, or to any part of the body, all bearing the same relation to the general system.

So far as disorders of the teeth are independent of any connection with the general system, when such affections are of so slight a character as not to lead to any possibilities of disorders not strictly confined to their own immediate structure, it is easily understood that, while the remedies applicable are simply and purely mechanical, as in simple caries, an entirely efficient dentist may be a person without any knowledge whatever of the nature of disease. Unfortunately for the progress and development of dental surgery in this country, this has long been considered, not only by the public, but by prominent dentists themselves, as sufficient qualification. It must be admitted that the arrest of simple caries is accomplished by the most simple of mechanical operations. Although the teeth form a part of the human body, the exterior portions of the dentine and enamel possess so low a degree of vitality that they may be considered without the range of diseased action. This applies, however, to but a part of their curious and complicated structure. This affection makes but slight progress before it develops a degree of vitality not exceeded by that of any part of the body, rousing at once into action the widest sympathies, and leading, at times, to the most serious results.

This, of course, will not be disputed, and this renders necessary, as

an essential part of the education of a dental surgeon, the study of what are known as general principles of medicine.

If the study of general medicine, so far at least as to obtain a general knowledge of the nature of disease, and the nature and action of remedies, is necessary to the ophthalmic specialist, who is occupied with the treatment of a strictly local organ, why should not this knowledge be requisite to the education of the dental specialist, who is equally concerned with the treatment of another set of organs, the systemic connections of which are identical?

That a close relation of dentistry to general medicine was recognized by those who made the first movement toward the establishment of a system of dental education in this country is obvious from the original curriculum of the "Baltimore College of Dental Surgery." The faculty then consisted of four professors,—two of these were practicing physicians; one of them taught anatomy and the other "special pathology and therapeutics," although the course, as will be seen by reference to Prof. Bond's work, entitled "Dental Medicine," had a wider range. Subsequently a professor of chemistry, who was not a dentist, was added to the faculty. In all the colleges now in existence in this country anatomy and chemistry form a part of the course.

Not only is this the case, but the better men in the dental profession are looking not only to no restriction of this attention to general principles, but to its extension. This opinion is not confined to those who are disposed to criticise adversely the present system. Its importance is admitted by some who are themselves engaged in teaching.

I will refer to the utterances of several of the professors of the colleges in support of my statement.

The papers read and the discussions which took place in relation to this subject at the meeting of the New York Odontological Society, held in December of last year, brought out more fully than heretofore the views of gentlemen connected with the dental colleges. From what was said it appears that, while they defended the present system, admissions were freely made that a medical education, combined with proper practical training, would be an advance upon the present system.

Prof. Truman, arguing against the "opinion so generally held, that this" (medical) "training is all-sufficient for dental practice,"* admits that a combination of medical teaching and practical training would make "a perfect whole."

Prof. Chandler, of the Harvard Dental School, says, "We are a branch of the medical profession, and should be recognized as such. If we are, we should make our education up to the medical standard in

* So far from such an opinion being general, I do not know any one at the present time, whose opinions are worthy of consideration, who holds such a view.

its special branches, and our schools to a level with the best medical schools."

Prof. Buckingham, while he does not consider it necessary, does not "object to a thorough medical education; in fact, I would recommend any one who has the time, means, and capacity to obtain not only a medical education, but all the knowledge he can in every branch of science."

Prof. Marvin, of the New York Dental College, refers to dentistry as a "specialty of medicine."

Prof. Stellwagen recognizes the dental profession as "an offshoot—a somewhat young and tender one—from the great tree of knowledge,—a twig of the great branch that represents the medical profession."

To those who have given any attention to the "signs of the times," it must be abundantly evident that similar sentiments are prevalent among the best class of minds in the dental profession at the present day. This is stated strongly by Prof. Chandler in the paper read by him on the occasion referred to.

"Mechanics by nature, our people found dentistry essentially mechanical, and with all their energy they devoted themselves to giving a short time to learn its elements, trusting to future experience and instinct to make up for any deficiencies. What was abundance for a young and growing people is scant for its adult strength and greatness. The education which, at the time of the founding of our first dental school, was ample, has been outgrown; and to attempt to feed us now with the viands of that day, is to leave us hungry. Our profession and the public demand more, and more they will have, and woe to the man or the school that stands in the way! He and it will succumb. The demands of the profession upon the schools are daily seen in our magazines and in the transactions of the dental societies throughout the land. The cry is the same."

If, then, it be true, as is admitted, not only by the more intelligent men of the dental profession generally, but, as I have shown, by prominent men connected with the dental colleges, that an intimate connection exists between dentistry and medicine, what objection can be made to classing dentistry as a medical specialty?

The next step in this investigation will be the inquiry as to how far this general medical instruction is supplied by the present system of dental education. In making this inquiry, as I propose very thoroughly to do, I must disclaim any other motive than a very earnest desire to contribute to the highest interest of a profession to which I have devoted the best years of my life. I disclaim any other personal motive; and if, in the examination I make, I shall closely criticise the shortcomings of these institutions, and, necessarily, the individuals connected with them, it must be admitted that public institutions, and those who con-

duct them, should expect to have their claims to confidence freely canvassed.

Intimations have been made that those who have ventured upon such an undertaking are ignorant and prejudiced. I have had some experience in teaching, and cannot be accused of ignorance of the workings of these institutions. The character of the investigation I shall make will, I trust, absolve me from the charge of prejudice.

(To be continued.)

AN INQUIRY INTO PHYSIOLOGICAL AND PATHOLOGICAL CHANGES IN ANIMAL TISSUES IN REGULATING TEETH.

BY J. N. FARRAR, M.D., D.D.S.

(Read before the Brooklyn Dental Society, April 12th, 1875.)

GENTLEMEN OF THE BROOKLYN DENTAL SOCIETY,—Before entering upon my subject, I wish to say that I do not claim any new method or peculiar apparatus for regulating teeth. I propose to speak this evening upon the results of experiments made by myself. I wish, first, to explain or show a law of nature which should be understood by every dentist who regulates teeth; and, secondarily, to discuss the relative merits of the different principles upon which regulating apparatuses are made.

If I refer sometimes to old and familiar facts and some uninteresting matter, I ask your forbearance, inasmuch as such allusions are necessary, to make my story connected and intelligent to all.

In any treatment for regulating teeth, and in performing some other operations depending upon pressure on the tissues, the great danger to guard against is undue inflammation.

In some cases the correction is easy and simple, producing little or no pain or inflammation; in others the operation is difficult and tedious, accompanied by pain and inflammation. Are these differences owing entirely to a difference in the constitutions of different people? or do they mainly lie in the *manner* the operations are performed?

The object of this paper is to show that more depends upon the operator than upon the patient. It is easy to understand why any operation performed upon a scrofulous or anæmic person will not, as a rule, be followed by so happy and speedy results as would be the case if the system were perfectly healthy; but of greater importance in such operations are some other points which I propose to discuss.

From observations of a series of experiments made by myself upon teeth, it was found that certain results always follow like circumstances. In other words, "like causes produce like results." Again, it was found that the difference in results was due not so much to the temperament and conditions of different people as to the manner of treatment.

This led me to consider various well-known operations in surgery, and it appeared evident that all of them which depend upon pressure, such as dilating strictures, ligation of tumors, and regulating teeth, involve and are subject to much the same physiological laws. To illustrate the operation of these laws in one class will explain my idea of all.

The treatment for regulating teeth was instituted for correcting a defect where the eruption had taken place in a crowded, irregular manner in the arch, producing deformity of the features, incorrect articulation of speech, lisping, imperfect mastication, etc.

It was noticed, a long time ago, that a tooth, although much out of line, would, in some instances, imperceptibly move into the proper arch, apparently without cause; and in other cases its movement would be hastened by digital pressure upon the tooth, repeated several times per day for a long period. This led to the idea, that by attaching something which would keep up a constant tension the tooth would be compelled to move faster; which, being put to trial-test, proved true. From this grew up a system of moving teeth, which now constitutes a part of the practice of dental surgery. The tooth acted upon by pressure moves through the alveolar process, causing absorption of the same as it advances, leaving a space behind, which becomes filled with fibrin or plasma, which organizes into cartilage, then finally into secondary alveolar process. These changes require from one to two years, depending upon the age and constitution of the patient. Hence the

Fig. 1.



Fig. 1 represents a specimen in my cabinet of the second left superior bicuspid, with large amount of exostosis upon the root. The neck has been worn away to a thin flat ribbon by a gold clasp of a partial plate of artificial teeth, which was secured to it.

reason why it is sometimes necessary (when the articulation of the teeth does not suffice) for the patient to wear a finger-plate in the mouth, after the teeth are regulated, to hold them in proper relation until this ossific deposit takes place. This part of the operation is often more troublesome than moving the teeth.

In fracture of bones, where reunion is tardy or difficult, it is a well-known fact that an increased irritation of the parts, caused by forcible movement of the contiguous surfaces of the broken bone, will hasten the repair. This extra inflammation causes additional osteoplastic deposit, which hastens the union of the fractured parts.

The working of this law is well shown in the exostosis of the roots of teeth seen in sewing-women, who are constantly biting threads, producing slight inflammation, sufficient to cause ossific deposit.

In moving teeth, the slight inflammation of the alveolar process at the point in the socket in the rear of the departing tooth, causes in the

same way (so far as we are able to judge) a deposit of cartilage material in the space left.

It will be seen that in this act or movement of a tooth a double physiological operation is going on,—absorption on one side and deposit on the other. Exactly *how* this absorption takes place is not well understood. First, pressure is a primary cause, and absorption the result. These are facts we all can see.

As it is so common to theorize, I may be pardoned if I give here my views. The pressure of the tooth upon the soft alveolar process, or socket, causes more or less devitalization of the contiguous cells, which are broken down and carried off by the absorbents, which possibly are somewhat stimulated by the *slight* inflammation acting upon them through sympathy from contiguity and continuity, while the advancing tooth, interfering with the blood nutrition, prevents new cells taking the place of the old ones. Thus the tooth moves as fast as the cells give way before it. In other words, the tooth advances by "displacement."

You will bear in mind that the tooth in these operations acts upon the other surrounding tissues very much as a foreign substance; the influence being similar to that of a catheter when left for a considerable length of time in the urethra, in treatment for stricture. Aneurism of the aorta pressing upon the vertebræ, producing absorption of those bones, beautifully illustrates the same point.

On the opposite side of the tooth the reverse of absorption is going on. The tissues are constantly separating, and the space between the departing tooth and the socket-wall is filling with new cells, formed from the exuding plasma.

In the treatment for regulating teeth, the operator meets many obstacles, especially in the construction of apparatus to obtain desired results. The great desideratum in his mind *has* been to *move the teeth*, without much regard to physiological laws. It is no easy matter to secure apparatus to slippery conical teeth, and it is no wonder that some dentists rest contented after gaining this point.

Teeth may be moved in any direction from one-fourth to one-half inch, and in some cases even more. Generally they are moved laterally, but may be depressed or raised in their sockets. The principal apparatus, except those on the inclined-plane principle, is, and always has been (since this branch of the profession has been vigorously prosecuted), made of rubber, so secured to the teeth by ligatures and metallic bands as to keep up a constant tension on the tooth to be moved. This constant traction, after a day or two,

FIG. 2.

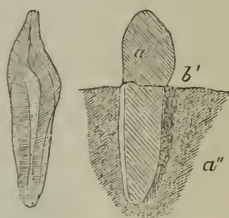


Fig. 2 represents the track of the migrating tooth, *a'*, through the alveolar process, *a''*, leaving the space, *b'*, to be filled with new cells, as shown.

starts the tooth from its old home a very short distance. It continues to move slowly from day to day, from week to week, as long as the tension is maintained, the apex remaining comparatively stationary as the crown advances.

FIG. 3.

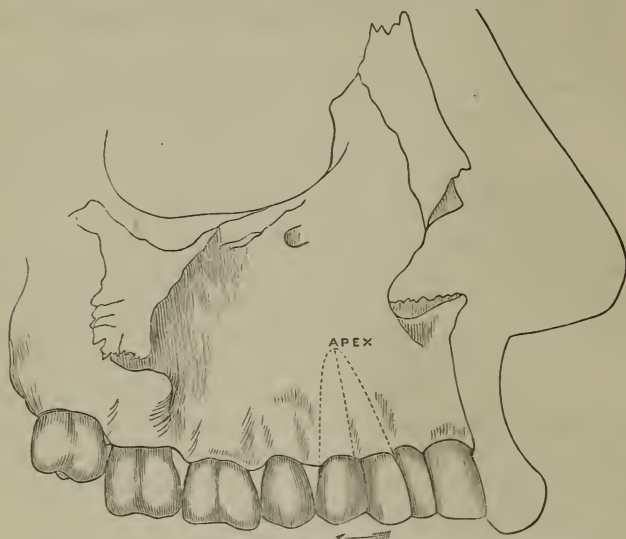


Fig. 3 represents the path of a regulated tooth with stationary apex.

In these operations, especially when the roots are perfectly ossified, it is sometimes found that the nerve-pulps of the teeth die, from some injury to the filamentous portions at the apex, either by rupture or by jugulation of the pulp by congestion or inflammation in the adjacent parts, caused by improper management of the case, thus sometimes

FIG. 4.

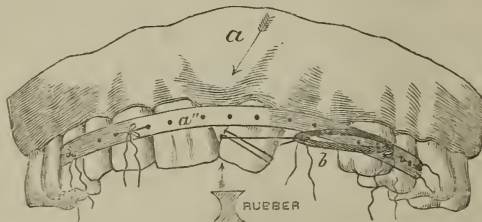


Fig. 4 represents a specimen in my cabinet, treated by the rubber plan; *a* represents position of the left central incisor under the gum, erupting six years after the mate; *a'*, gold band; *b*, rubber ring, under tension; the ligatured tooth is a left lateral incisor in contact with the right central incisor.

giving rise to pain, alveolar abscess, and frequently causing discoloration of the tooth, perhaps secondarily elongation of its visible portion,

with looseness, or, it may be, its entire loss; all of which are results entirely unnecessary,—the reason of which will be shown farther on.

It is found that the unfavorable cases are those in which the tooth has been moved a considerable distance, the operation having been accompanied by much inflammation and pain, as before mentioned, while those moved but slightly have caused little or no pain or inflammation, requiring but short treatment. Therefore the difference must arise from the degree of tension, or length of time, or both.

Now, it is well known that all animal tissues, especially the softer, when under pressure, are subject to certain physiological or pathological changes. A tight ligature around the finger will arrest the venous circulation and cause pain and inflammation, and sometimes death of the part, from mortification,—a pathological change. On the other hand, a moderately-tight ring will, in time, without pain, make room for itself, by causing a diminution of the portion of the finger pressed upon, provided the pressure be not so great as to materially arrest the circulation of the blood. This is a healthy or physiological change. Thus we see in one case too severe pressure causes too much inflammation, leading to pathological or unhealthy changes, while a more moderate pressure produces only physiological or healthy changes.

From these facts it appears plain that there must be a line beyond which pressure cannot be long sustained without producing degenerative changes.

We may go further to illustrate this point. Bandaging of broken limbs, when properly done, will even have a stimulating effect in supporting the tissues, while, on the other hand, bandages too tightly applied will produce injury, even to gangrene and mortification. In the former case, the action is physiological; in the latter, pathological.

By certain well-known experiments, it is also seen that the power of the absorbents will become impaired, or may cease altogether, when inflamed beyond certain limits. This is well exemplified in devitalizing exposed pulps of teeth by arsenic. If the pulp be highly inflamed, its vitality will not always be destroyed by the drug; but if previously treated by some astringent for a few days, to reduce the inflammation, the arsenic will be absorbed.

From these considerations, it will be seen that undue pressure upon the tissues will, if allowed to remain too long, produce inflammation, and will also modify or arrest the action of the absorbents, and all together produce unhealthy changes in the parts involved. On the other hand, tissues can receive a moderate amount of pressure, causing absorption, and yet not passing beyond healthy action. Therefore there *must* be a dividing line within which we may operate successfully, and beyond which we cannot. Where this line is, and how to find it, is the principal object of this paper.

This brings us to one more point for consideration before we apply our results to practice,—that is, pain—always to be taken into account in all surgical operations. Pain is a great evil, and must be prevented, if possible; especially must not be allowed to be continuous. There must be periods of rest for the nervous system, or it will suffer, and may even break down.

A patient will endure great pain if it be alternated with periods of rest, while a less degree of pain, if incessant, will soon wear out the person afflicted.

In some respects, though not exactly a parallel, this may well be illustrated by patients undergoing the operations for filling teeth by the aid of the hand-mallet. If the taps be very rapid and continuous, the patient becomes nervous and irritable and writhes in the chair; but if the taps be intermitted by one or two seconds of time for rest, the operation can be borne for hours without much trouble. The nervous system *must* have rest; so must the other tissues, as will be shown farther on.

The point above referred to, concerning rapid malleting, I will, however, qualify, though it be a digression somewhat from the main subject. All such disagreeable impressions as those from malleting, filing, or from discordant sounds of any kind act more especially through the nerves of the special sense of hearing; thence oftentimes to and through other nerves, causing various muscular contractions.

We all know that filing or malleting upon the upper teeth, which have a bony connection with the organ of hearing, is far more disagreeable than the same operations performed upon the teeth of the lower maxilla, which lies inclosed in the "soft tissues," so that the only point where the disagreeable impressions are conveyed at all is through the small cushion of the articular cartilage between the condyle of the lower jaw and the glenoid cavity of the temporal bone.

I do not wish it understood that I am giving an illustration, except by way of comparison; for pain, as we generally term it, is an indication that something is out of order, and is conveyed through the agency of the nerves of sensation; but pain, as generally meant, has nothing necessarily to do with the nerves of hearing, or with any other nerves of special sense.

I make this comparison, because by it I can more clearly illustrate the effect of what is generally called pain; stopping short of the argument by which we might easily show that all disagreeable sensations, through or by *any* nerves, are but different forms of pain, indicating that something is going wrong somewhere.

The brain and nervous system have a limit in perceiving and recognizing impressions (though distinct), when made rapidly. The faculties or powers of different people differ in this respect; but there is a point

peculiar to each individual where taps upon teeth in rapid succession cease to be separately recognized.

If we place the plugger of an electric mallet upon a tooth and set the hammer at work, producing blows no more rapidly than in the ordinary use of the hand-mallet, but continuously, the patient endures it for a short time, but only a short time. But if the rate of speed be increased, without removing the instrument from the tooth, the patient grows more and more nervous until the increasing rate of speed reaches the point where the senses begin to fail to recognize distinct blows, when the sensation grows less disagreeable, and becomes less so as the rate is increased from this point, until the effect is like one continued sound, growing smoother as the rate is increased,—exactly as the notes of a great organ change from the low trembling bass to those smooth oily ones of the treble.

We see from all these premises or considerations, to return to our main subject, that all the differences in operations which produce healthy or physiological changes by pressure depend on the degree and period of time the pressure is applied.

This brings us to another and our most important point, namely, that in all operations, by pressure, to dilate or in any way to produce absorption of tissues, the pressure should be periodical, not continuous,—a little at a time, not enough to produce pain,—allowing the *tissues* to act, then a period of rest; but the pressure should never be reduced, except through absorption. Pressure once properly made, should be maintained. To illustrate this I will give the results of my experiments upon teeth, which will show in the main the principles of all such operations.

Let us take an actual case for illustration: A young lady, aged fourteen years; nervous temperament, though somewhat of the sanguine; good health, but not robust; and living rather an in-door life. The eight front teeth in her upper jaw were very irregular; so much so as to prevent correct articulation in speech, as well as in bite, causing a lisping sound.

It was determined as the best method of procedure in this case to extract the first right bicuspid as the first step, and force the cuspid back into the space produced,—thus to assist in giving room to move into line in the proper arch the four incisor and left cuspid teeth. After extracting the bicuspid, there was left a space of three-eighths of an inch between the cuspid and the second bicuspid. The most improved rubber elastic apparatus was then applied for two weeks to move the cuspid, giving rise to great pain and inflammation of the gums, and to great nervous exhaustion. Although strong rubber elastics were used, yet they had not up to this time moved the tooth in the least, which was supposed to be due to the great length of the cuspid roots

and firmness of the socket. This apparatus was then removed, and the parts allowed a few days of rest.

After the inflammation had subsided, a different apparatus was applied with better success. A very thin gold band was fitted around the cuspid, and extended back along the lingual surface and around the first molar tooth, leaving a space between the ends of the gold strap on the buccal surface of about six-eighths of an inch. On each extremity of this strap of gold, at right angles, was soldered a nut, through one of which was cut a screw-thread. Through these nuts

FIG. 5.

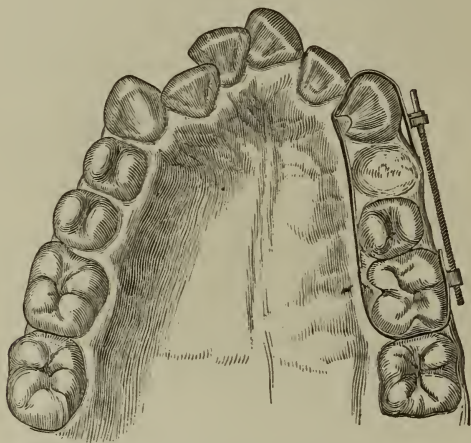


Fig. 5 represents the first step for treatment with the gold band and screw applied. The second step of the same treatment on the opposite side is not shown. From a cast in my cabinet.

passed a screw one inch in length, having sixty threads; the screw being fitted at the anterior or mesial extremity for a watch-key. This

FIG. 6.



Fig. 6 represents the simple band and screw with a key applied.

simple apparatus having been applied, the screw was turned so as to cause a slight sense of tightness, or pressure, but not enough to produce pain. This sense of tightness passed away after about an hour, leaving no unpleasant feeling whatever. Even the instrument caused little or no inconvenience. The screw was turned one-half of a revolution morning and evening,—thus advancing it one-half of a thread, or $\frac{1}{120}$ of an inch by each operation, or $\frac{2}{120}$ of an inch per day.

It should be borne in mind that the gold band had but one screw; consequently, when it was advanced $\frac{1}{120}$ of an inch, the tooth only moved half that distance, or $\frac{1}{240}$ of an inch, at each operation, and, as the operation was performed twice every day, the tooth moved $\frac{2}{240}$ of an inch, or $\frac{1}{120}$ of an inch per day.

This rate was found to produce no pain. A repetition of the sense of tightness was noticed for about one hour after every advance of the screw, but it was easily borne by the patient, and produced no perceptible inflammation. The cuspid tooth continued to advance at this rate ($\frac{2}{240}$ of an inch) daily, causing no pain. It may be well to state here that no perceptible change took place in the position of the two posterior teeth, around which the clasp was fastened, because the three roots of the molar and the broad, flat root of the second bicuspid acted as very firm anchors.

This slow advance of the tooth, $\frac{2}{240}$ of an inch per day, acted so admirably that it was thought best to increase the rate of daily progress, with the view of hurrying the operation, if possible. Accordingly, the screw was turned a whole revolution each morning and evening, instead of one-half. This advanced the screw $\frac{4}{120}$ of an inch per day, and the tooth half that distance, $\frac{2}{120}$ of an inch, or $\frac{4}{240}$ of an inch. This produced some pain, which lasted about three hours, gradually passing away. It now became evident that this rate was too rapid; but, to make the experiment still more satisfactory to me in a scientific point of view, the screw was advanced still another half thread each morning and evening, amounting to three revolutions per day. The pain now became almost continuous, and considerable inflammation began to be noticed. The patient became irritable, and began to show signs of nervous exhaustion; but it was noticed that these pains, after eight or nine hours, by degrees became less. The screw band gradually lost its pressure as the tissue gave way before it, differing in this respect from the rubber apparatus, which keeps up a constant force. This satisfied me that my previous views as to elastic rubber being unsuitable for moving teeth were correct. It also proved that a certain amount of pressure, by the use of some apparatus acting on the principle of the screw, can be applied periodically, and be followed by no pain or unhappy results.

(I will here say that, however correct my reasonings may be, and whatever the facts may be, about these laws of Nature, I do not wish it thought that elastic rubber should be dispensed with entirely, for there are some cases where we cannot apply the screw principle in a way to accomplish the desired end. For instance, for twisting teeth in their sockets rubber has the advantage, because the ligatures will hug tightly and continuously, and will not be so liable to slip their hold, as any apparatus made upon the screw plan is very apt to do; yet if the latter

could be fastened so as to prevent this, it would be better. We are obliged to choose between the disadvantages of the two.)

To return to the case in hand. The screw was then slowly lengthened or set back, so as to produce no pain, and subsequently advanced one thread per day, as before. The remaining teeth were brought into the proper arch and twisted into line, partly by the use of rubber, as above mentioned, creating no pain whatever, when the screw method was applied according to the laws previously shown. The twisting by rubber alone, whenever resorted to by me in this case, caused some pain. This pain may, however, sometimes be partially avoided by the use of hooks and shove-bars attached to screws.

The time required to complete this case, moving and twisting the teeth, was about five months. Some cases will admit of a trifle greater advancement of the tooth than $\frac{2}{240}$ of an inch per day. A variation from this standard, by the addition of $\frac{1}{240}$ of an inch per day, will be found, I think, to suit all cases. Forty to sixty days is the time, depending upon the age of the patient, necessary to move a tooth one-fourth of an inch by this law.

After a little practice, the operator, and even the patient, may trust the sense of touch to give the proper rate of progress to the migrating teeth.

My custom now is, to advance the tooth until the pressure causes a slight uneasiness, resembling that produced by a bit of food between the teeth. This point lies between $\frac{2}{240}$ and $\frac{3}{240}$ of an inch advance daily; that is to say, the screw, with sixty threads to the inch, may be given from one-half to three-fourths of a revolution each morning and evening,—best at 9 A.M. and 6 P.M. This gives sufficient time for the tissues to act and rest between the operations, and interferes less with the patient's comfort. The patient, being in no pain, will be as social and cheerful as if no operation was going on, and in a short time can be taught to turn the screw or key, thus saving nearly half the otherwise necessary visits to the office.

If, by some misfortune, the apparatus slips off the tooth or teeth, it should be immediately replaced, as the teeth being regulated will immediately begin to rapidly retrace their steps, and will require a long time to safely regain their lost position, on account of the undue congestion and inflammation, which soon sets in.

This rule holds good, also, in exchanging one apparatus for another. No time should be lost. The new one should, if possible, be ready before the old one is removed.

These principles or laws of absorption of animal tissues by pressure are applicable to all tissues—except the enamel of teeth, nails, and hair; but the rate of absorption produced may vary somewhat in different

tissues of the body, each having its particular rate, but all subject to the same laws of physiology and pathology.*

There is another plan of regulating teeth which, in a scientific light, so far as the laws of Nature are concerned, ranks between the screw and the elastic rubber principles, which produces an intermittent pressure, but does not maintain its gained ground as well as the screw; I refer to the well-known inclined-plane principle, an apparatus sometimes made of metal or ivory, but more generally of hard rubber, so formed as to fit tightly over the teeth of one jaw, and so shaped as to form an inclined plane for the irregular teeth of the opposite jaw to bite upon, giving them a tendency to slip on the inclined surface in the direction desired.

This is a very simple method, and particularly applicable to children whose teeth are only imperfectly developed, the roots being not yet perfectly ossified. Although the pressure is not applied with as much scientific accuracy as by the screw plan referred to, yet, as the unossified roots of the teeth are partially elastic, the crowns will yield easily. Again, the inclined-plane apparatus can be used when the teeth are short and of conical shape, where no other principle can be successfully applied. The patient causes a pressure upon the irregular teeth every time the jaws are firmly closed; and although it be applied only momentarily, it is so often repeated that the result is generally very satisfactory. By this plan, any undue inflammation is prevented by the pain caused if the patient bite with undue force.

The inclined plane may sometimes be used to move fully-developed teeth; but they move very slowly, and it often fails to produce the desired result, because the patient becomes discouraged, and is not willing to continue its use long enough.

From these experiments we deduce the following conclusions:

1st. That in regulating teeth, the traction must be intermittent, and must not exceed certain fixed limits.

2d. That while the system of moving teeth by elastic rubber apparatus is unscientific, leads to pain and inflammation, and is dangerous to the future usefulness of the teeth operated upon, a properly-constructed metallic apparatus, operated by screws and nuts, produces happy results, without pain or nervous exhaustion.

3d. That if teeth are moved through the gums and alveolar process about $\frac{1}{240}$ of an inch every morning, and the same in the evening, no pain or nervous exhaustion follows.

4th. That while these tissues will allow an advancement of a tooth at this rate ($\frac{1}{240}$ of an inch) twice in twenty-four hours, the changes being physiological, yet, if a much greater pressure be made, the tissue-changes will become pathological.

* The writer is continuing a series of experiments intended to test this law on various tissues in different parts of the body.

THE LAW.

In regulating teeth, the dividing line between the production of physiological and pathological changes in the tissues of the jaw is found to lie within a movement of the teeth acted upon—allowing a variation which will cover all cases—not exceeding $\frac{1}{240}$ or $\frac{1}{160}$ of an inch every twelve hours.

DENTAL EDUCATION.

BY L. G. NOEL, M.D., D.D.S., NASHVILLE, TENNESSEE.

(Read before the Odontographic Society of Pennsylvania.)

PERHAPS at no time in the history of the dental profession has this question commanded so much attention as at the present. It occupies a large proportion of the time in the meetings of societies. Our periodicals are full of it, and the whole body of the profession seems to be awakened to the necessity of better facilities for teaching, and a more thorough training of those who are taking upon themselves the responsibilities of our calling. The question naturally occurs to us, Why is this subject eliciting so much attention at this time?

The subject of general education has of late years occupied the minds of the people more than in times past. As our republic has grown and developed into a great nation, and as wealth and luxuries have increased, educational facilities have been developed, free schools, colleges, and universities have sprung up, and stand as indices of the culture and refinement of every community. The amount of attention that this subject of general education is eliciting at present is evidenced by the number of educational associations that have been organized and the interest manifested in them, not only by teachers, but by the general public. We have not only our National Educational Association, but we have our State Teachers' Associations, and similar organizations have been effected in nearly every county. When the question of general education is being so much agitated, and facilities for general education are being so greatly increased, it is but natural that the reform, commencing in the trunk, should spread to all the branches, and that the professions and business specialties should catch the enthusiasm and join in the effort to fit men for their special duties.

That the dental profession is thoroughly aroused upon this question we take as a good augury for its future. There is an increasing demand for better-educated dentists, and the more cultivated practitioner is preferred over his less erudite competitor, even though his manipulative ability may be inferior.

The law of supply and demand, ever as inexorable as the laws of the Medes and Persians, operates with like force upon the question of pro-

fessional service as upon articles of merchandise. The people demand better dentists, and they *will* have them, for men will rise up from their midst to suit their wants.

Every dentist gathers around him a class of patrons suited to the class of services he is prepared to render: if he is a dabbler in amalgams and cheap fillings, the amalgam patient will seek him; if he be only mediocre as an operator, he will have a class of patrons corresponding to the services he is capable of rendering, and so on. We find the wealthy, cultivated, and refined seeking the operator who is not only skilled in the performance of artistic operations, but who is capable of instructing his patrons in the laws which govern health and disease. The demand for a better class of operators is also evidenced by a demand for a better class of dental services. There is less demand for anæsthetics, fewer teeth are being extracted, and there is a consequent diminution in the call for artificial substitutes. This has been especially the case in our own field of observation, and we presume it has obtained in all cultivated communities to a like extent.

The necessity of a reform in dental education being conceded, the great question we have to grapple with to-day is, Where shall the reform commence, and to what extent shall it be carried? Shall it commence in the offices of preceptors or in the colleges? Evidently, it must commence at the beginning. After all that has been said about the necessity of the exercise of discriminating judgment on the part of practitioners in the selection of students, it would seem that we could add nothing more, and yet to our mind this paper would be incomplete—literally without beginning—did we omit its mention; for it is the foundation upon which the whole subject rests. So long as dentists continue in the loose way which now prevails to such an alarming extent, of taking students into their offices with an eye only to the amount of assistance they are to render, and without regard to their education and social position, just so long will the great mass of the profession be illiterate. It is our honest conviction that the time has now arrived when a thorough classical education should be demanded of all students who apply for admission into our ranks. We know we are venturing upon contested ground, and that many will differ with us on this point. Yet these are our honest convictions. In this age of free schools and free education, every young man can educate himself who has in him those elements upon which success depends. We ask, What business has a young man to choose a profession who can scarcely spell the commonest English word correctly?

That many such are taken as students no one can deny. It has always been objected, whenever this truth has been urged, that such a requirement would exclude many worthy young men who would make good dentists, and we are pointed to certain gentlemen as examples of

what may be made of even illiterate young men. However true this may have been in the past, it is false now, for we live in an entirely different age and under an entirely new system of education.

These very men who are cited as examples of what may be made of illiterate boys, if you will only take them into your offices and help them, furnish illustrations of the truth of what we have just been saying, for of all men they would have been the ones to avail themselves of educational advantages had these been accessible to them.

Let the requirement be made, and young men who have industry and force of character will meet it. No fear of excluding them. If they are poor, they will go to work and make the money they require to prepare themselves.

None but young men of at least fair literary education, good address, and good moral character should be received into our offices as students; nor should these be taken without requiring a bond of honor that they will take a thorough course at a dental college before entering the field of practice.

Now, a word as to office-training.

What books shall be placed in the hands of the student? In what direction shall he study? We would confine him, at first, to three studies, viz., anatomy, physiology, and chemistry. These should be by the best authors, of course. The student cannot always be delving into his books, and if he choose to recreate with mechanical dentistry, we would not object; but it is a shameful fact that the pursuit of this branch of dental knowledge engrosses the bulk of the term of office-instruction in most instances. We would remark just here, however, that the office or laboratory is, in our opinion, the only place where this branch should be taught. The time has come to leave it out of the college course. There is no time for it in two short courses of five months each.

The student will find most instructive recreation in assisting at the chair, and he should avail himself of every opportunity to watch the manipulations of his preceptor. Fortunately, since the introduction of the mallet, these opportunities are not few.

The student should be grounded thoroughly in osteology, so as to prepare him for dissections, and to do this he must have access to a skeleton and disarticulated cranium. We would put no work on dental surgery in his hand until he is thoroughly grounded in these three fundamental branches, nor would we do so until he receives his M.D. degree, if he design taking a medical course before entering a dental college.

And now, a word about the advisability of taking a regular medical course. Much is being said just now about dentistry as a specialty of medicine and the recognition of this claim by the medical profession.

The medical journals have also been heard from, and much that has been said in the war of words that has been raised had better have been left unsaid. We would advise every dental student to take a regular medical course, under the conviction that nothing short of this will fit him for the duties of his calling.

How much do the colleges need reforming? In associations where the subject of dental education has been under discussion, we have listened with indignation, not unmingled with shame, to the insidious attacks made upon the colleges. We have heard them charged with lowering the standard through mercenary motives, with flooding the country with ignorant pretenders, licensed by their diplomas to bring odium upon the calling, etc. We do not intend to say that all of the colleges have been as judicious in the bestowal of their degrees as they should have been, we do not claim that the curriculum of study has been as thorough and systematic in all as it ought to be, or that the courses pursued by their alumni have ever been such as to reflect honor upon these institutions; but we do claim for them the credit of having done more to bring the dental profession up to its present high standing than any other agencies whatever. Some one will say: Not so fast just there. The dental associations have done that work. The men who founded the first dental college, organized the first dental society, and the faculties and trustees of the colleges have ever since been the most vigorous fosterers of associated effort. They have not only been the leading spirits and most zealous workers in the dental societies, but they have been the originators of our dental journals and the largest contributors to our literature. The reform must begin with preceptors,—those who should be the patrons of the colleges. Only let the profession support the colleges as it should, and all the needed reform in them will soon come.

Out of the ten thousand dentists practicing in the United States, there are not more than eighteen hundred graduates. Let the young men of these ungraduated eight thousand two hundred enter the colleges as students, and give them their pecuniary support, and a new order of things will speedily be inaugurated, not only in the colleges, but in the field of practice.

There is but one college in America that has a building that was erected for, and adapted to, the purpose of dental teaching, and unless some wealthy dentist or philanthropist will give a fund for the endowment of some one of these institutions, this condition of things is likely to continue; for they do not receive sufficient patronage from the profession to justify their faculties in making the outlay. How easy it would be for a profession numbering some ten thousand to raise an endowment fund for some one of these colleges, if unanimity of action could be secured and each one would contribute his mite!

It is to be hoped that the effort will be made. Let us cease to complain of our colleges, and give them instead our approval and material support.

CASES OF ORAL SURGERY IN DENTAL PRACTICE.

BY W. SCHIBBYE, D.D.S., QUITO, ECUADOR.

HAVING had some opportunity for practicing oral surgery here, I beg leave to offer my last year's experience to my young colleagues.

Caries of Upper Jaw.

A young lady came to me for examination of her mouth. She had suffered a violent inflammation in the upper jaw some three years ago; a fistule was established in the gum and had not been brought to close, in spite of a long course of treatment. Every now and then she would have violent pain and swelling in the part, and a bloody discharge of pus, causing her much uneasiness. On examination, I found the right canine tooth of a bluish color, indicating a dead pulp, but no decay visible. The gum about the fistule was of a dark angry hue, discharging much blood on being touched. Having enlarged the fistule by means of a cotton tent, I found the root of the canine tooth penetrating a cavity the size of a hickory-nut, and the root presenting a broken-off appearance. The lady was very anxious to keep the tooth, and I therefore opened it from the buccal face, filling the root with gold after proper cleansing and disinfecting. After enlarging the fistulous opening, I then with chisels scraped out all the soft, decomposed bone until meeting with hard, unyielding structure, and finished the operation with injections of alum-water slightly acidulated. The cavity, quite a large one, was then filled with cotton and this replaced with cotton moistened with iodine, which in a few days brought on a favorable reaction. Daily injections of sulphuric acid and water were used for fifteen days, when the cavity was filled with new material and the fistule closed. The cure remained perfect.

A gentleman from a neighboring republic came to me for examination of a disease which had existed for some time in his upper jaw. He did not know how it commenced, but told me that the wisdom-tooth on that side had never erupted, and that he first noticed the disease by a fetid discharge. On examination, I found a cavity in the maxillary tuberosity, occupying the place of the right wisdom-tooth. The parietes were in some places soft and spongy; in other places a hard porcelainous deposit was felt, but no tooth or root of tooth was to be discovered. I supposed it either to be a disease caused by destruction of the germ of the wisdom-tooth, or a kind of caries, in which disease this state also is to be found. There was no entrance to the antrum. I

adopted the manner of treatment for caries, removed some parts with cutting-forceps, and the enamel-like deposit with an elevator, finishing with injections of dilute acid. Daily applications of iodine or chloride of zinc made the cavity contract and fill up. The patient soon left for his home, but I have lately heard from him that he is entirely well.

Through my friend, the late American minister here, I obtained the treatment of a most remarkable case. The patient, a young married lady, had for the last six years been under constant treatment by medical and surgical practitioners without the least avail, and was deemed incurable by all. For the last six months she had been under the care of a French surgeon, professor of surgery at the university here, who, as I understood, advised a resection of the superior maxilla, but did not want to perform the operation himself. He wanted her to go to Europe to have the operation performed, but family circumstances preventing this, she abandoned all hope of cure. The history of the case is as follows: One night she went out in the cold wintry air, and remained out half an hour. The next morning she had the most violent pain in her face, which settled in her upper jaw. For two weeks she suffered the most excruciating torture without any relief. A great many remedies were employed, hot and cold applications, leeches, etc., until at last, by means of an incision into the gum upwards, relief was obtained, and nothing further done. The wound left by the incision did not, however, heal as it ought to. Not long afterwards she had another violent inflammatory attack, with discharge of pus, and several fistules established themselves by and by. From that time until now she has suffered constantly. Every now and then a violent inflammation would come on, with great swelling and much pain, when, after two or three days' intense suffering, a copious discharge of blood mixed with pus, *débris*, and small spicules of bone would give instantaneous relief. Upon the least excitement she would frequently have copious hemorrhages of dark blood. Belonging to a prominent and wealthy family, nothing has been spared to effect a cure. Injections of all kinds of remedies for such cases have been used. One surgeon had extracted a healthy lateral incisor in order to treat the disease through the socket. Another, thinking the antrum diseased, extracted the second bicuspid, perforated, and made injections of caustic potash, which caused such a violent inflammation that the eye protruded from its socket and the cheek broke open, leaving the disease as formerly. Resection of the maxilla was proposed, but abandoned. At last, after everybody had tried and failed to cure the case, she gave up all hope. Under these circumstances, I was called to give my opinion. I found on examination a fistule between the central incisor and

canine tooth, the gum of a dark angry hue around the fistule, discharging much blood by the least touch. The teeth and gums elsewhere perfectly healthy. She had never had any discharge through the nostril, nor any indication whatever of antral disease. By means of an excavator, I examined the bone through the fistule, and found the true honeycombed condition of caries, with several larger canals. The cicatrices of two fistules were also found in the gum. I advised an operation to remove the carious portion of the bone. To this the lady at last consented, and I undertook the operation, assisted by a friend, a professor of anatomy here. She was put under the influence of ether, and I then dissected the lip and soft parts from the bone, taking the fistule as a center. Turning the soft parts upwards, I then scooped out all the diseased bone by means of chisels and a scoop-formed elevator, until meeting with hard, unyielding bone, finishing the operation with copious injections of sulphuric acid and water. During the day and the next following, applications of lead-water and laudanum were made to mitigate vascular excitement. Dover's powder at night and a dose of citrate of magnesia the next morning were employed. On subsequent examination of the affected part I found a very large cavity formed, with the roots of the central incisor and canine-teeth penetrating it and entirely naked, but firm. The palatal bone was affected to a considerable extent, and also the boundaries of the nasal cavity. The first excitement past, I stuffed the cavity with lint moistened with iodine, followed by injections of dilute sulphuric acid. On the sixth day reaction commenced and suppurative granulation was established, and the cavity was seen to be diminishing. Injections of sulphate of zinc, slightly acidulated, were first used, then iodine, and, lastly, chloride of zinc. Exercise in the open air, rich food, and malt liquors were recommended. After about six weeks the whole cavity was filled with osseous granulations, and the fistule was closing. The lady then left for the country; but on her return I found that a degeneration had destroyed part of the new bone and that a small cavity still existed in the cortical portion. I recommenced treatment with sulphuric acid and water, which soon brought on a good reaction, terminating in a perfect cure, it being now a year since the operation.

Malposition of a Wisdom-Tooth.

A case of wrong eruption of a wisdom-tooth which had caused a great deal of suffering for two years came under my care. The patient, a young married lady, had not been able to open her mouth well for two years, living on liquid food, being unable to chew on account of two ulcers which had been formed by a right upper wisdom-tooth erupted horizontally towards the cheek. Extraction had been tried by

several physicians and dentists, but without avail, and it was deemed necessary to cut open the cheek and extract it from without. I did not find much trouble in extracting it with a lower incisor hawk-bill forceps, and the lady soon recovered her health and spirits.

Osteo-Cystoma of Upper Jaw.

A young lady of sanguine temperament had for the last six years suffered from a disease which had resisted all treatment. How it commenced she did not know, but every now and then a minute abscess would form in the gum above the left lateral incisor, discharge and close again. I found her face disfigured by a uniform swelling, extending from the right central incisor to the first left bicuspid; the gum was only slightly darker than elsewhere. I also found the opening not yet closed, wherefrom a few days previous a discharge had come. Examining with an excavator, I found at last a round hole in the bone, between the central and lateral incisor, the size of the handle of an excavator, which led to a cavity extending from the hard palate below to the turbinated bones above, from the boundaries of the nose to the alveoli of the teeth. No roots penetrated the cavity, and but little fluid was contained therein. The parietes were smooth and velvety to the feel, and no granulations to be felt. Her teeth were all in perfect order,—not one decayed, and the gums healthy. To treat the cyst I broke up the parietes with a curved scoop through the opening in the bone, and syringed out with sulphuric acid and water. I then stuffed the cyst well with cotton and iodine, and afterwards used iodine, alternating with chloride of zinc. The fleshy feel of repair was soon apparent, and the cavity filled up gradually and contracted. After a cure of three weeks the hole in the bone was closed, the gum healed, and the case has remained cured.

PROCEEDINGS OF DENTAL SOCIETIES.

MERRIMACK VALLEY DENTAL ASSOCIATION.

THE Merrimack Valley Dental Association held its annual meeting at Manchester, New Hampshire, November 4th and 5th, 1875. The following gentlemen were elected officers for the ensuing year:

President.—Dr. A. M. Dudley, of Salem, Massachusetts.

First Vice-President.—Dr. T. Fillebrown, of Portland, Maine.

Second Vice-President.—Dr. L. F. Locke, of Nashua, New Hampshire.

Recording Secretary.—Dr. W. E. Riggs, of Lawrence, Massachusetts.

Corresponding Secretary.—Dr. J. H. Kidder, of Lawrence, Massachusetts.

Treasurer.—Dr. H. Hill, of Manchester, New Hampshire.

Librarian.—Dr. A. Lawrence, of Boston, Massachusetts.

Executive Committee.—Dr. C. G. Davis, Dr. A. W. Tenney, Dr. A. Severance, Dr. J. B. Prescott, Dr. T. Haley.

After a pleasant and interesting session, the association adjourned to meet at Portland, Maine, the last Thursday in May, 1876.

W. E. RIGGS, *Secretary.*

OBITUARY.

IN MEMORIAM—DR. A. W. MORRISON.

At a special meeting of the St. Louis Dental Society, held on Wednesday evening, June 16th, the following resolutions of respect to the memory of Dr. A. W. MORRISON were unanimously adopted :

Whereas, Dr. A. W. MORRISON, an active and respected member of this society, has been removed from our midst by death ; therefore,

Resolved, That in the death of Dr. A. W. MORRISON the profession has lost an ardent, sincere, and valuable member, and one whose many excellencies of character have endeared him to all with whom he became associated.

Resolved, That the members of the society deeply sympathize with the relatives and friends of our departed brother in this their sudden bereavement.

Resolved, That a copy of these resolutions be presented to the family of the deceased, and that they be published in the dental journals.

JOSEPH N. TOURTELOTTE, M.D.

DIED, at West Midway, Massachusetts, in April last, of disease of the heart, Dr. JOSEPH N. TOURTELOTTE, after a severe illness of several years. Dr. Tourtelotte was a worthy member of the dental profession, always sincerely desirous for its advancement, and assisting in its progress while strength permitted. Even during the years of his intense suffering his interest did not abate, but he hailed with pleasure every forward step. He studied and practiced in Worcester, Massachusetts, during a period of twenty years, where hosts of friends mourn his loss. During the early years of his practice he attended lectures and received the degree of the Boston Medical School. During the Rebellion he enlisted as a private, but was soon made surgeon, and served in that capacity until illness compelled him to leave the service.

He took a prominent part in the formation of the Central Massachusetts Dental Society, and was one of its first officers. He was

beloved by all who knew him as a true friend and agreeable companion, an honored member of society, a kind husband and an indulgent father.

BERTRAND J. PERRY, D.D.S.,
New York City.

PUBLISHER'S NOTICE.

THE NEW VOLUME.

THIS issue introduces the eighteenth volume of the DENTAL COSMOS. Succeeding numbers will be issued on the first of each month following.

The circulation of the DENTAL COSMOS has steadily increased from the first volume to the present. Within the last three years its subscription-list has grown beyond all precedent. We are well assured that the subscriptions for 1876 will far exceed those of any previous year, but believing that, at the price at which it is offered, no practicing dentist can make a better investment, we invite those who have not heretofore subscribed for it to send in their remittance for the eighteenth volume on trial.

We request all who desire to subscribe or to renew their subscriptions to do so promptly, that we may determine the size of the edition which will be required.

Dr. J. W. White will continue the editorial supervision.

We send this number to former subscribers, but will discontinue after this issue, unless the subscription shall be renewed.

WE SHALL ADHERE TO THE SYSTEM OF CASH PAYMENT IN ADVANCE.

SAMUEL S. WHITE.

PERSONAL.

DR GEORGE W. FIELD, who, on account of failing health, was compelled last year to abandon his practice in Geneva, Switzerland, has so far recovered as to be able to resume his profession, but he has located in London, England, No. 39 Upper Brook Street.

Dr. N. W. Williams, formerly of Xenia, Ohio, has succeeded Dr. Field in Geneva.

Dr. Visick has succeeded to the practice of the lamented Mr. Sercombe.

PERISCOPE.

SECOND DENTITION AND ITS ACCOMPANIMENTS.—I have spoken of the disturbances which exist at the time of the first dentition. It is a time when the nervous system of the child is very easily disturbed, and when a very large number of children die. They are said to die of "teething;" that is the word very frequently made use of in the reports. But it is not a fair statement; the death is consequent in the great majority of cases upon improper feeding. The false pride of the parent has led him or her to indulge the child in this or that improper article of diet, so that it becomes disgusted with the food which nature provided in the mother's breast, and with the nearest approach to it which can be prepared artificially.

Let us pass over a few years, however, and suppose that the dangers attendant upon the first dentition have been overcome. The tough children have fought the battle through, and have survived the diarrhœa caused by fried potatoes, and the headaches produced by griddle-cakes, and the nausea and vomiting following upon the use of pork and beans and mince-pies. And now a new set of disturbances comes up, even with the children who have been properly fed and clothed. Diarrhœa begins with those who escaped before; loss of appetite, headache, pains in different parts of the body show themselves. You are called in to give your advice upon these points, and to see if you can discover why the little boy or girl is ailing. Look in the child's mouth. You know that it is somewhere from five to twelve or thirteen years old, and that during this time it is likely to be losing the twenty so-called milk-teeth, and that others are coming in their places. The nervous system of the child is not quite so easily, or rather not so seriously, disturbed as it was while those milk-teeth were pushing their way; but there is a very great change going on, and that nervous system is more easily disturbed than during the last two or three years. It is the part of the dentist to say if this or that tooth should be removed in the case of the particular child, but it is your business or mine, as its medical attendant, to say that dentition is going on, and that due caution is to be had in the matter of diet and exercise and sleep. It is not simply the case that the fang of this tooth has become absorbed as another is growing up beneath it, but there is also a new tooth coming in a part of the mouth that has had no tooth before; and the eruption of that tooth in an improperly-fed and poorly-clad child is very likely to produce wakefulness, or drowsiness, or nausea, or cough, or an eczema, or some other disturbance of one or another part of the body. If you find any of these disturbances, it is quite as much your duty to look at the teeth, and to give your caution about feeding and clothing and exercise, if you find a reason in the gum, as it is for you to feel the pulse or look at the tongue, and form your opinion and give your instruction from the signs afforded by them. Bear this in memory, that disturbed digestion will as surely produce cough in one patient as it will produce headache in another; and that the second dentition will often produce as much disturbance as the first, although the sufferer may be better able to bear it, and a simple chill or a febrile attack of a few hours' duration may be had in place of what would be a serious convulsion in the younger child.

I think it would be unpardonable neglect were I not to speak in this

connection of the fact that dentition is by no means completed at this time, although about this period a fourth molar is making its way into sight. Nor should I forget to call your attention to the fact that in some families, even as late as the eighteenth or twentieth year, I have seen these fourth molars making their way and producing a serious amount of disturbance, both in the digestive and in the nervous system. Probably there is a majority of you gentlemen who remember the pain and soreness and vertigo which attended the appearance of your wisdom-teeth, and how for weeks and months, yes, perhaps for several years, before they got their growth, they pressed upon the gum and produced loss of appetite and restless nights and irritable days. Those of you whose memory upon this point remains green can easily imagine the suffering of the little child whose mouth is filled with torments, or of the older boy or girl who is forced to study or to labor with these causes of disturbance still at work. At this time, when these fourth molars are coming through, occurs the age of puberty, a period of excessive nervous disturbance with those who are thus disposed. It matters not whether the subjects be male or female. It is a season when great caution should be exercised by those who have children under their observation and care, and many male as well as female children have been ruined in health because the parents have been ignorant of the periodical disturbances which are constantly going on. The first of these periods of disturbance is at the appearance of the first tooth; this is usually when the child is taking its natural food. The second period is when the system has had something of a rest, but when a mistaken attempt has been made to educate its stomach to digest grain and fruit, but no attempt has been made to retain its fondness for milk; this is usually before the close of the second summer; and when the larger proportion of the deaths take place. The third is when the early part of the second dentition is going on. The fourth is at that time when the fourth molars are beginning to make their way, and when the effort of nature is made to declare the peculiarities of sex. At each of these times the child is more liable to disease than at others. These are the seasons when our profession is the most likely to be consulted by careful parents, and when diseases of the brain, of the stomach, and of the lungs are the most likely to begin.

To laugh at the unmanliness of the boy or girl who is teething is a matter of as great absurdity as to laugh at the weakness of one who is coming down with a fever. It is not necessary to make babies of them, but it is as well to watch them, and to see that they are not overworked either in body or in mind. The old lady will say that they are only "growing pains" which are causing the disturbance, but it does not hurt to grow; if it did, the young man or woman of eighteen would be always in pain, and the little one of a few months, who has sometimes gained a pound or more a week, would never smile.

Look in the mouth, therefore, and let your attention be paid to the teeth and gums as well as to the tongue.—*Charles E. Buckingham, M.D., in the Boston Medical and Surgical Journal.*

EXPOSED PULPS.—I had prepared a paper upon the treatment of "exposed pulps," with my method of "capping" them, when your admirable editorial upon the subject, in the May number of the *Register*, appeared. The principles of treatment are there so clearly and satisfac-

torily set forth (the reader is particularly referred to it) that it will not be necessary, for my present purpose, that I should do more than briefly recapitulate them in this article, in which I wish to direct attention to my mode of "capping nerves."

The first indication of treatment, of course, is to remove and permanently exclude all irritants.

This can only be done thoroughly by a free and full opening-up of the cavity, so that direct access may be had to every part of it. The condition of the pulp itself will then suggest the therapeutic treatment demanded. If inflamed or congested, sedatives and astringents will be required; if suppurating, Oakley Cole's treatment of pepsin is good enough. A systemic regimen may have to be instituted to meet a malarial, mercurial, or syphilitic cachexia. But, in a healthy system, the main thing is to protect the pulp from irritation, and nature will come to the rescue, and very soon restore it to a normal condition.

Having then freed the pulp from all external irritants, and made such topical application as may be necessary, the next step is to secure this condition, to await the kind offices of nature, or as the basis for a permanent operation.

With the pulp in readiness, what are the requirements of a nerve-capping? The material must be unirritating, a non-conductor, accurately adapted to the point of exposure, and hermetically sealing the orifice to the pulp.

You say "these requirements are easily understood, but the substance to supply them completely is not yet obtained."

I claim that I have such a substance, and that my mode of using it is superior to any of the many methods of "capping" pulps that I have seen recommended. I do not say that it is not used by others, but I claim that, with myself, it is original, and that it has been very successful in my hands. Dr. King's method of the batter of oxide of zinc and creasote with the *os-artificiel* is good. Dr. Francis's method of note-paper and balsam of fir with *os-artificiel* is good; the method of the egg membrane I have used, with happy results, isinglass, court-plaster, and *os artificiel*; but none of these modes completely fill the bill.

My material is the common pink base-plate gutta-percha dissolved in chloroform, in conjunction with *os-artificiel*. Notice, the gutta-percha is the base-plate, and has its own peculiar advantages.

With the cavity carefully prepared, the rubber dam in position, and all things in readiness, a drop of the solution, taken up with an instrument or on a pellet of cotton, is to be applied to the point of exposure.

The chloroform very rapidly evaporates, leaving a thin pellicle covering on the exposed pulp. The evaporation, which is very prompt, may be hastened with the air syringe, and the coating may be made thicker, if desirable, by a second application.

Upon this flooring an *os-artificiel* filling is to be placed, which will afford a firm foundation for a gold filling.

We thus have our pulp protected by a durable material which, applied in a plastic condition, has smoothly and accurately conformed itself to the surface of the pulp, is unirritating and a non-conductor, and is firmly adherent to the floor of the cavity.

With this condition of things preserved, will not nature attend to the balance? We may safely trust her. Very slight co-operation is all she needs. I have great faith in the "*vis medicatrix naturæ*."

Nearly any pulp, however inflamed, short of suppuration, will return to a normal condition if secured from irritation. I fear many pulps are dosed to death with escharotic applications.

The following peculiar characteristic properties particularly recommend this solution. The gutta percha is so promptly soluble that it can be prepared upon the moment and at nominal cost. It evaporates very rapidly, acquiring the desired consistency directly. It contains so much earthy matter as to form a stratum of appreciable thickness. It is very adhesive, sticking closely to the walls of the cavity. Its pink color renders it readily visible wherever placed,—an important consideration. It is a perfect non-conductor. The chloroform is soothing to the pulp and sensitive dentine. It can be made so thick as to be easily applied to an upper tooth even. And, finally, being insoluble in the chloride of zinc, it cuts off the usually severe pain following the application of the os-artificiel. This last I regard as of great moment, for I believe many pulps succumb to the escharotic effect of the chloride of zinc, which otherwise would have survived.

I had tried, several years ago, to use, in a similar manner, the white gutta-percha solution, obtained at the dental depots, but abandoned it because it evaporated so slowly; it left too thin a film; its color made it impossible to know what was being done with it; and it was so fluid that it could not be used in upper cavities except with great difficulty.

I have so much satisfaction in the daily use of this solution for this and a variety of purposes, that I beg my professional brethren who may have a prejudice against it, or in favor of something else, to just try it for a few times, and I think they will involuntarily exclaim "Eureka." I wanted to give in detail some of these other uses, but the length of this article admonishes me against it. I will merely mention some of them.

I use it as a temporary filling in sensitive cavities; as a covering over arsenic in shallow cavities; as a temporary expedient in cavities where, for the want of light, time, or other reason, I can't make a thorough examination; in the aching teeth of timid children ("*ne plus ultra*"); in conjunction with os-artificiel, over nearly exposed nerves, to intercept the chloride of zinc; to protect os-artificiel fillings against moisture; to stop a leak through an accidental puncture in the rubber dam; upon a conical tooth to prevent the dam from slipping off, etc., etc. It is, in fact, my "Man Friday," without which I cannot get along.

The first I ever saw of the solution, Dr. E. W. Harker was using it for the protection of his os-artificiel fillings against moisture, and to him belongs the credit, so far as I know, of its introduction into dentistry. —*William C. Wardlaw, D.D.S., in Dental Register.*

PIVOT TEETH.—Cases are frequently presented to the dentist where it is necessary to insert one or two front false teeth in a mouth which requires no other artificial substitutes. The desirability of avoiding a plate of any sort, when possible, is apparent. Therefore, where it is possible in these cases to insert a false crown in the natural root, this is the plan to be followed. But it is not unfrequently found that the root to which we wish to attach the false crown is too much decayed to allow the insertion of a pivot with any reasonable prospect of success. Again, in many cases when a pivot has been inserted in a root that

was at the time sound, it has subsequently decayed around the pivot and ultimately a plate was the only resort.

The introduction of a metallic tube into the root is neither new nor novel, for I remember to have seen it advised while I was a student; and by referring to Harris several modes of introducing it will be found described. But my plan somewhat differs from any of these, and I think it simpler and more reliable. At any rate it answers the purpose admirably, as I have had several opportunities of late of knowing, having seen tubes which have been inserted for many years, the roots apparently as sound as ever.

When it is found desirable to introduce a tube, the first process is to thoroughly excavate the root. By *thoroughly* I mean to give the word its fullest significance. Every particle of *débris* of every sort should be taken away. If the pulp has been but recently devitalized, then all that remains of it, and the lining membrane in contact with the dentine, should be removed. If dead for any length of time, the proper treatment should be applied, and no risk run of future alveolar abscess. The root ready for filling, tin foil may be introduced into the upper part. Some use gold, but I prefer tin. The root is now ready for the tube.

This may be of various sizes, and made of either gold or platina plate. I always use those made of the latter metal. If a working jeweler is at hand, he is the best man to make the tubes, for they are used for brooches and other articles of jewelry. If the dentist is obliged to make them, roll out the plate very thin, cut it into a narrow strip, and, having bent one end over a wire, pass through a wire plate.

Having selected a tube of the proper size, drill into the root as far as it is prudent—under no circumstances coming in contact with the dental periosteum—with an instrument the exact size of the tube. Then cut a well-defined groove in the dentine at points where it is practical, using the same precautions as in drilling, and taking care to have the grooves above the edge of the gum, else, in filing down the root, they may be filed away and there is nothing left to retain the filling. Then cut off a piece of tube the proper length and solder the edges. Gold foil, the refuse of fillings, is the best for platina, but gold plate will answer. If the tube is gold, of course ordinary solder must be used. In soldering drop on, here and there, a bit of plate. Harris recommends a screw to be cut on the tube, but the plate is too thin for a thread of any depth. Two or three “knobs” on the tube will be of much more use in retaining it in its place. The tube being all ready, fill it with plaster of Paris. When this has *set* remove every particle from the outside.

The root and the tube being prepared, the latter may be introduced and the remaining space in the root filled. If this is done effectually, the root will, in almost all cases, be preserved from further decay, the tube will be securely fastened into the root, and the foundation have been laid for a false crown to be adjusted in the most secure manner. With that overwhelming predilection for gold under almost all circumstances which the American dentists of the better class have always shown, Harris recommends the filling to be made of this material. But the difficulty of keeping the metal dry in such a case is apparent; and a gold filling in which moisture has intruded is inferior to a tin-foil filling which has had the same misfortune. Therefore, as between these materials, I recommend tin unless the tooth has enough of the crown left to allow the rubber dam to be securely fastened. A gold filling

may then be introduced by an operator who is capable of making *first-class gold fillings*. None other should attempt it around a tube. A less skillful operator may attempt tin with far greater prospect of success. Some of my tubes retained by tin fillings have lasted for nearly twenty years, and these were made before the days of rubber dam.

When the filling is made of foil, it is by far the best to pack the metal by the malleting process. An instrument something like Nos. 13 and 15 in Snow & Lewis's set of automatic pluggers' points, or Nos. 14 and 25 of Abbott's points, will be found sufficient in all cases.—*Old Practitioner, in British Journal of Dental Science.*

ON A METHOD OF PIVOTING.—I have undertaken to make a casual communication to this society on a method of pivoting—not so much because I have anything particularly novel to bring forward as regards the method of performing this operation, as because I am wishful to draw attention to and evoke opinions upon a *principle* in our treatment of tooth-disease, which has been passed over by distinguished writers on dental surgery, and has (I think) somewhat fallen into unmerited neglect. The principle I allude to is that of leaving a permanent vent open for the escape of products of decomposition,—purulent fluid and gas,—which, being pent up within the tooth, or contained in an abscess-sac around the end of a root, are pretty sure to necessitate the loss of the tooth, and may give rise to extensive mischief. The “safety-vent practice” can, I believe, be with advantage adopted in certain cases of pivoting, in many cases of stopping of teeth in which the pulp is dead, and in the allied cases where necrosis of pulp has resulted from rupture of its nutrient vessels. In practice, given the desirability of saving a tooth's crown by stopping, or of retaining a root for pivoting, it seems to me that, whenever there is evidence of periosteal inflammation being established, or a suspicion of the formation of alveolar abscess, it is far better to adopt this plan rather than to attempt fang-filling after any amount of dressing.

Again, when roots cannot be thoroughly stopped, either on account of their position or minuteness, it is, I believe, better, after extirpating the pulp, to leave root-canals empty, and give them a vent, rather than to put an unsatisfactory filling into them.

In carrying out this principle in the case of pivot-teeth, the plan I adopted some half-dozen years ago, and have constantly practiced and taught since, is the following:

Having extirpated the pulp and syringed out the root-canal, the bore of the latter is equalized to the depth of half an inch (or less, according to the length of the root), cylindrical burs of graduated sizes being used for this purpose. The root-barrel is then rifled with a small excavator, and a platinum tube (the same as used for lining pin-teeth) is packed in with amalgam; the patency of the canal and the tube is insured by retaining a piece of pin-wire in them until the tube is fixed in place. The amalgam being set, an impression is taken, the exact direction of the tube being shown by inserting into it a piece of pin-wire. A root treated thus is preserved from further decay. The crown is affixed by a split gold pin, which may be narrowed in one direction if much vent is required. In applying this principle to teeth that have to be stopped, rhizodontropy is performed. A small vent-hole is drilled into the pulp-chamber at a point just below the free edge of the gum;

into this hole a pin-wire is passed. The pulp-chamber, with its extensions into the roots, is covered over by a pad of gold-foil, vulcanite, or some other cap. The crown is then filled and the wire withdrawn. When there is an amalgam stopping at the neck of the tooth, a canal may be drilled through it; or, if a cavity has to be filled in this situation, one end of a wire can be placed in the pulp-chamber, a stopping introduced around it, and the wire afterwards withdrawn.

I would mention, from among others, two cases to illustrate the value of this treatment: A friend of mine had in his mouth the root of an upper lateral incisor, the subject of alveolar abscess, which at frequent intervals gave rise to a swollen face, and the flow of pus from which was so large that an eminent surgeon concluded dead bone was present. This root, pivoted on the above plan, has for years supported a crown with perfect comfort. Second case: Some months back a young lady came to me suffering considerable constitutional disturbance, as well as local discomfort, due to an alveolar abscess which had just burst into the nares, and which was connected with an upper central incisor. The tooth was at once re-stopped (in the above-mentioned manner), and neither tooth nor abscess has given further trouble.

Since penning the foregoing remarks, I have had the pleasure of reading papers which were read before this society some ten years back by Mr. Cartwright and by the late Mr. Hulme. In both these papers somewhat favorable views were expressed with regard to the original operation of Dr. Hullihen, or modifications of it; but neither author advocated the practice of ventilation by the means that I now feel justified in recommending.—*Mr. Moon, before Odontological Society of Great Britain.*

SUPERFICIAL PARTIAL NECROSIS OF THE HARD PALATE, PRODUCED BY PRESSURE FROM A RUBBER PLATE.—Although partial or superficial necrosis of the jaw-bone is by no means rare, its production as a consequence of the pressure of a rubber plate has up to the present time not occurred in my practice.

I have sometimes seen that the hinder margin of the upper plate, and the side edges of the upper and lower plates, have from pressure produced deep wounds and ulceration of the soft parts, and that patients have borne this condition with true animal courage for weeks, but I have never seen partial death of the bone ensue. It may, however, be expected that partial death of the bone might arise from continuous pressure on the gums, when we remember that rapid periostitis passes on to suppuration, disturbs the periosteum, and causes necrosis. Internal causes, such as scrofula, syphilis, and so on, naturally favor the condition of necrosis. In the case under my observation it was not the edges of the rubber plate which caused necrosis; the pressure was in the center of the arch of the palate, arising, therefore, from the palatine surface of the plate. The case is as follows: A delicately-formed small man, between forty and fifty years old, had several years previously lost almost all his teeth in the upper jaw, and was at last obliged, on account of his situation, to have them replaced by artificial ones. The palate was extremely small, and towards the front went to a pointed angle. The alveolus was very much shrunk, and only to the left were found two longish small back teeth. In the lower jaw incisors were present, the whole of the other teeth being absent, and the double bite

made a projection of the lower teeth remarkable. On the 26th of October, 1873, a black rubber plate with six teeth set in pink gum was placed in the mouth, fixed by rubber rings round the two natural teeth. The new teeth were well matched, and the plate fitted well. After four weeks (November 22d), the patient finding the plate too loose, wished to have gold rings instead of rubber fastened firmly round the teeth. After the alteration the teeth fitted like wax, and the patient left extremely satisfied. However, already by the 29th of November he returned, complaining of pain in the center of the palate, where the plate pressed on a space the size of a pea. The plate was adjusted, and the patient given tincture of myrrh. December 14th.—The patient otherwise well, but the spot on the palate not healed. On using a blunt sound, a rough movable substance was felt in the middle of the ulcer in the palate, which being removed by hooked nippers was found to be a piece of necrosed bone, one millimeter broad and four millimeters long. The place was constantly painted with tincture of myrrh, and by the 31st of December was completely cured.

The patient thought that a small splinter of bone from food had got under the plate and caused the abscess. I found, afterwards, on closely observing the plaster impression, in the center, exactly where the pressure occurred, an elevation like an oat grain, which the pressure from the palate dissipated so greatly that a corresponding impression in the rubber could not be discovered. In this case we must not overlook a predisposition, which the outward appearance of the man and a stiff knee-joint suggested.—*Fr. Kleimann, in Deutsche Vierteljahrschrift—Monthly Review of Dental Surgery.*

CASE OF EXFOLIATION OF THE SOCKET OF A TOOTH.—The patient, a lady, came to have the first left lower molar removed under the influence of nitrous oxide. It was in a very bad condition, nearly the whole of the crown being softened by caries. She took the gas very well, but made a very rapid recovery; unfortunately, the tooth was fractured. The gas was administered again, and the elevator used for the extraction of the stumps, but again without success, as her almost instantaneous return to consciousness prevented a proper attempt being made. The patient being at the time in rather a weak state of health, it was deemed advisable to postpone further operations until some few days had elapsed, and she promised to call again. However, she did not, but went on a visit to some friends in the country to try and benefit her health. She was then suffering great pain, and was, to use her own words, nearly mad. The result was that extensive inflammation and suppuration had taken place, and in about a fortnight from the time of my first seeing her she noticed that the roots seemed to have risen from their places and become so loose that she was enabled to remove them with her thumb and finger, the sockets coming away likewise; one root was unfortunately lost, but the other is sent with this paper.

In conclusion, I may remark that I have seen and treated a great many cases of necrosis of portions of both the superior and inferior maxillæ, but those cases have been owing either to long-continued inflammation and retention in the mouth of roots of teeth that kept up a constant discharge of matter, or where a syphilitic history has been distinctly traceable. But I have not before seen a case where inflammation has been followed so rapidly by suppuration and necrosis of the parts affected.—*Harry Rose, L.D.S, in Monthly Review of Dental Surgery.*

INTERRUPTED DEVELOPMENT OF A TOOTH-GERM.—A short time ago a remarkable case came under my observation. In a boy, eleven years of age, there appeared over the second temporary grinder (the first being still present) the crown of a bicuspid—the temporary tooth not being at all decayed—which was to be extracted.

By a superficial examination it struck me that near the new crown pus was present, and on touching the same I convinced myself that the new crown was decayed. Examining the contour, I pressed directly on the neck of the tooth below the crown. Under these circumstances, which admitted of no doubt that the germ had been disturbed during its development, there remained for me only extraction of the new tooth, which was accomplished by a slight movement of the probe. The perfect temporary tooth was of course left in its place. The bicuspid fully developed as far as the neck, thus brought to light, had assumed its characteristic form, and had the appearance of a normal temporary tooth expelled by resorption, with a deep erosive furrow, with the real caruncles, which the remains of the tooth-germ showed. Traumatic causes were not owned by the patient, but frequently-occurring abscesses were there. Were the abscesses the cause of the decay of the tooth-germ, or were they rather the consequence,—that is to say, did they arise from the dead tooth as a foreign body? We shall probably not be wrong if we agree to both. Consecutive abscesses led principally to the diminution of the tooth.—*Alexander Scheller Warschau, in Deutsche Vierteljahrsschrift—Monthly Review of Dental Surgery.*

SALIVARY CALCULUS.—Dr. Porter exhibited a salivary calculus. For two years a woman forty-two years old had noticed a tumor of her neck, occupying the submaxillary triangle, and about the size of a horse-chestnut. It could be felt also in the mouth, and had been accompanied by pain for about three weeks. The tumor, on section, proved to be a hypertrophy of the submaxillary gland, and in its center there was a small salivary calculus in a cavity containing pus.—*Proceedings of the Boston Society for Medical Observation, in Boston Medical and Surgical Journal.*

HEMORRHAGE FOLLOWING TOOTH-EXTRACTION.—For the notes of this case we are indebted to the kindness of Mr. H. P. Potter, house-surgeon.

A man, T. W., aged thirty-three, was admitted into Leopold ward on Tuesday, August 10th, for hemorrhage from the seat of a tooth drawn on the previous Friday. He gave a history of always bleeding freely from slight causes, and he stated that about twelve years ago he had a tooth extracted, after which he bled for eight days. The hemorrhage was stopped with the actual cautery.

The tooth drawn on the 6th August was a large molar on the left side. As the bleeding was profuse, the patient had medical treatment outside the hospital for four days.

On the 10th August, in consequence of the hemorrhage continuing, and as the ordinary means for its arrest had not succeeded, the patient was admitted. He was not much affected by the loss of blood, and looked healthy. The clots were removed from the mouth, and the bleeding surface discovered, which appeared to be the whole of the tooth-cavity and the surrounding gum. Plugs of lint were used steeped in a strong solution of perchloride of iron, and the teeth pressed firmly together with a bandage beneath the jaw. This stopped the bleeding

for several hours, but on account of the reappearance of hemorrhage, the solid perchloride of iron was used, and with better effect. The latter, however, caused much irritation and swelling of the face.

August 13th.—Feels very weak; lost about half a pint of blood during the day. Patient takes a fair quantity of milk.

14th.—Bleeding very profuse; no good result from graduated pad and solid perchloride of iron. As the man was becoming very weak, the application of the hot iron was decided upon. This was done under the influence of ether.

15th.—Hemorrhage ceased for twenty hours, but at the end of that time it reappeared.

17th.—Actual cautery used, which stopped the bleeding for eighteen hours.

18th.—Bleeding profusely at 2 A. M.; cavity firmly plugged with cotton-wool saturated with solution of iron; subcutaneous injection of one grain of ergotin every day.

20th.—No improvement in patient; blood can be seen to well up from the tooth-cavity; face much swollen; occasional attacks of delirium.

21st.—Cavity plugged with gutta-percha, and afterwards with plaster of Paris, neither of which succeeded in stopping the bleeding.

23d.—Patient has been losing about a pint of blood daily for the last three days. Has become very exhausted and pallid; speaks of noises in his ears and bright objects before his eyes. Ten grains of gallic acid given internally every two hours, and a subcutaneous injection of morphia at noon and midnight.

24th.—Less bleeding to-day. Takes a fair amount of nourishment.

25th.—Bled about five ounces this morning. Plugged with cotton-wool and strong solution of perchloride of iron.

27th.—No bleeding for forty hours. Patient feels a little stronger, but has a very anæmic and peaked appearance.

September 1st.—Commenced solid food.

2d.—Up for the first time since illness.

5th.—Left the hospital.

Remarks.—Cases of prolonged hemorrhage after extraction of teeth are sufficiently uncommon to make them of interest; and when the bleeding continues, as it did in this case, over so long a period (fifteen days), notwithstanding very active means being employed, the case then becomes alarming, both to patient and surgeon. It is worthy of notice that, in the present instance, the blood appeared normal in its coagulating powers, and therefore unlike many of the recorded cases of hemorrhagic diathesis where the thinness and non-coagulability of the blood point to an alteration in its physical and chemical characters. Here it coagulated firmly and quickly. Throughout the case the pulse and temperature remained at their normal standard. Thirst was a marked symptom. It was found that the actual cautery arrested hemorrhage for some hours; but, on account of its bringing away incinerated tissue, the results of its use were inferior to firm plugging with the strong solution of the perchloride of iron.—*St. Thomas's Hospital Reports, in the Lancet.*

DIAGNOSIS OF THE LESIONS IN FACIAL PARALYSIS.—In a paper on facial palsy of rheumatic origin, in the *Deutsch. Archiv für Klin.*

Medicin, xv., s. 6, Dr W. Erb gives some extremely useful hints for determining the exact seat of the lesion of the nerve in any particular case, which we reproduce here for the benefit of our readers. His method depends on observing whether certain special branches of the facial nerve are affected or not simultaneously with those supplying the muscles of expression: 1. If the posterior auricular nerve is involved, the lesion is inside the canal of Fallopius. 2. If the sense of taste is diminished or destroyed on the corresponding side of the anterior portion of the tongue, the lesion is above the point where the chorda tympani leaves the facial nerve. 3. If the sense of hearing is abnormally acute for low notes and also for distinguishing small variations in musical tones, the nerve to the stapedius muscle, which is given off above the chorda tympani, is implicated. 4. If paralysis of the soft palate can be detected, we may conclude that the lesion involves the trunk of the facial from the geniculate ganglion onwards towards the brain. The application of these rules to a large number of cases has proved, according to Erb, that in the majority of instances of rheumatic facial paralysis the seat of the lesion is lower than the point of origin of the chorda tympani, and that in the mildest forms only that part of the nerve is affected which lies outside the canal of Fallopius; for, being thus surrounded with loose tissue, it cannot be seriously compressed by the swelling of the neurilemma.—*Medical Times and Gazette*.

INTENSE AND CHRONIC NEURALGIA; OPERATION; RECOVERY.—For the notes of the following interesting case we are indebted to Mr. F. W. Strugnell, house-surgeon.

George P——, aged fifty-three, a thin, spare man, with gray hair, looking older than his years, was admitted into Kenton ward on March 20th, 1875. For the last seven years the patient had suffered from intense neuralgic pains in the face, occurring at irregular periods. The attack of pain commenced by a sensation of twitching in and near the first bicuspid tooth on the right side of the lower jaw. This was very quickly followed by lancinating pain, very excruciating, extending from this part to the angle of the jaw and upwards towards the right temple, spreading both backwards and forwards. The first fit, the man stated, was brought on by yawning. Eating, drinking (especially cold drinks), talking, or tapping the tooth, would cause an attack, but not always. In the early morning the fit most frequently occurred, when at breakfast. To take food the patient lay on his back, took very small morsels, and ate very slowly on the left side of the mouth. The more frequent the attacks the less severe they became; sometimes they would occur two or three times a day, occasionally there might be an interval of twenty-four hours between them. The twitching pain in the tooth and about it was permanent. At first the pain commenced in the last molar tooth, which was extracted; but the pain then shifted to the next, and each time a tooth was removed the pain was referred to the adjacent one. Several drugs had been employed, most of which relieved for a short time, some not at all.

When an attack occurred, the patient sprang up, his face became red, his eyes suffused, and there was an expression of intense agony in his countenance; he seemed to lose all command over himself, rushed about the ward, with his hands at one moment tightly holding his jaw, at another tearing at his hair, and he had evidently lost control over

his actions. The fit subsided as suddenly as it began, and the poor fellow sank into his chair exhausted. The length of time an attack lasted did not exceed a minute. His previous history was good. He had had rheumatic pains in the knees and back for some years, but had felt nothing of them since the present affection.

On admission the patient was given bromide of potassium, and afterwards chloride of ammonium in twenty-grain doses, with seeming benefit for a short while. He slept well at night, the fits not occurring during sleep.

As the patient did not improve, and begged that something might be done, Mr. Savory decided, in consultation with his colleagues, to trephine the lower jaw and divide the dental nerve. This was done on the 21st of April. Two incisions, meeting below at an angle, were made in front of the masseter muscle on the right side of the lower jaw, and the triangular flap of skin raised; the bone was trephined, and a piece about the size of a sixpence removed; the dental nerve and artery were thus exposed in the horizontal diameter of the circle. Mr. Savory then cut out about one-third of an inch of the nerve.

For three or four days after the operation the patient still felt the twitching sensations, which on the second day were rather severe, but no fit occurred. Nine days after the operation he was able to eat an egg, and on May 2d was allowed fish. He was discharged on May 16th, quite well, with no pain of any kind. On May 29th he was still perfectly free from any pain.—*London Lancet*.

NITRITE OF AMYL IN FACIAL NEURALGIA.—Dr. George H. Evans, assistant physician to the Middlesex Hospital, London, places upon record the following cases (*Practitioner*, September, 1875):

It occurred to me about three years since, on first becoming acquainted with the effect of inhalation of nitrite of amyl, which was then said to flush the small vessels (first of the face and then of the trunk) by paralyzing the vaso-motors, but which at all events caused flushing of the face, etc., that it might possibly give relief in some of those cases of facial neuralgia which are obviously connected with, if not dependent on, anæmia. A case occurred which gave me an opportunity of testing this. A girl applied at St. Thomas's Hospital one Thursday morning, about 11 A.M., trying to get some relief for neuralgia, which had prevented her (she said) from sleeping since the previous Saturday. She was evidently in considerable pain, and markedly anæmic. Hoping for a possible immediate effect, I made her inhale some nitrite of amyl. It took rather a longer inhalation than I expected to produce the usual flush; however, it came, and she then said that she felt a throbbing and beating in her head, but the pain was subsiding. In a very few minutes she said the pain had left her. I was very doubtful about the amyl producing anything more than simply temporary relief, so I told her to come again if the pain recurred. She did not come again to me; but she attended Dr. John Harley (she was already an out-patient under him) on the Saturday, and said she had had no pain since the inhalation. I did not see her again.

The next case in which I used it for this purpose was that of an anæmic young woman who was in St. Thomas's Hospital with acute rheumatism, and who, during her convalescence, suffered much from facial neuralgia, which she said had tormented her since childhood. On

her the inhalation of amyl did not produce quite so striking an effect as on the former patient; but it invariably gave her relief, so much so that she said, "I wish you would let me take that little bottle out with me; I have tried all sorts of things, and never found anything do me so much good as that."

The third case I have to mention is that of a young lady, who was, in September last, suffering from severe neuralgia, whom I knew to be generally anæmic, and whom I noticed to be much more anæmic than usual at that time. She told me she was always paler when these attacks came on. I gave her some amyl to inhale; it was some time before it produced any effect, visible or otherwise; but as soon as it had produced a slight flush, she said the pain was relieved. I saw her three weeks later, and she told me that she always prevented the attacks of neuralgia by inhaling amyl when she felt they were coming on. One of her sisters, who was not anæmic, incautiously one day sniffed at the amyl bottle, probably because I had especially cautioned my patient against allowing any of her sisters to use it, and immediately her face became most painfully flushed, and she felt sufficiently uncomfortable to prevent her repeating the experiment. I think, from what I have seen of its use, that anæmic people (as one might expect) can bear very much larger doses of nitrite of amyl than those who are not anæmic.—*Monthly Abstract of Medical Science.*

ADMINISTRATION OF NITRITE OF AMYL.—A. Douglas-Lithgow, in the *Lancet* of October 16, 1875, gives his method of administering this remedy, which is to place two drops on the palm of the patient's hand, and quickly diffusing them with the finger over the palmar surface, the patient immediately covers the mouth and nose with the hand, and inspires deeply and quietly. The patient should be seated while inhaling, as the peculiar effects of the remedy are produced almost instantaneously, and may occasionally alarm a nervous and hysterical female. These symptoms last but a short time, and with their cessation the pain almost invariably ceases. Two drops of the remedy may be given as a draught in water instead of by inhalation, but the results of the latter method are far more satisfactory.

Some of the symptoms which may occur during the inhalation of the amyl are, in addition to the invariable flushing of the face, great throbbing in the temples, "fluttering of the heart," and a feeling of breathlessness, as if one was "dying away." Some describe a sensation of "tingling from head to foot," and others have experienced pains in the limbs analogous to cramp, while in other cases objects seem to acquire a bright yellow hue, such as sometimes results from the use of santonine. The severer symptoms are, however, by no means common. The writer has never seen any serious results from the administration of the remedy which he recommends, but he thinks that, owing to the temporary palpitation of the heart produced in most patients, care should be taken in administering it in cases of organic cardiac disease.—*Boston Medical and Surgical Journal.*

DEATH FROM ETHER.—We abridge the following statement from the *New York Herald* of November 22d. A man, fifty-four years of age, went to the homœopathic college in New York, on Saturday the 20th inst. "He was complaining of pain in the left upper jaw extending to the head, with great nervous prostration. There were four openings in

the jaw, all discharging fetid pus. On introducing a probe, caries of the upper jaw was found, and the patient was advised to have the bone removed." "He was placed under the influence of ether and *laid on the table*" (the italics are ours). "A physician was constantly feeling the patient's pulse while the ether was being given." An "incision was made into the upper jaw, and four teeth extracted." The operator was "about to extend the incision when he noticed the face of the patient become blue. Artificial respiration and the galvanic battery were applied, but they were unavailing; he was dead."

The reputation of ether, in doses even of a pound or two, has been hitherto pretty good. It has been tried on patients with hearts variously fatty. It will be difficult to persuade us that two and one-fourth ounces of this hitherto beneficial agent has proved so suddenly fatal, without any previous gradual diminution of the pulse. It should be conclusively shown that the patient died of nothing else. *This patient, so far as we can judge, died of asphyxia from blood in the trachea.* In the first place, after he was etherized, he was laid on his back. An "incision" was made in the jaw, and time enough elapsed to extract four teeth. Dead bone always makes the soft parts vascular. There was ample time for blood to fill the trachea. Until it is shown that there was no blood in the fauces and trachea this must stand as the cause of death. The autopsy is silent on this point. The suddenness and the lividity both belong to asphyxia and neither to etherization. In the Massachusetts General Hospital, operations on the mouth are usually done in the erect posture, with special attention to keeping the fauces clear of blood.—*Boston Medical and Surgical Journal.*

A SPEEDY METHOD IN ASPHYXIA (*The Medical Record*, July 31st, 1875).—Dr. Harvey L. Byrd believes that the following method will be found a highly valuable addition to our list of remedies in the asphyxia of children, and also for the relief of that condition in the adult, when properly applied.

Bring the *ulnar* sides of the hands near together, with the palmar surfaces looking vertically, and place them beneath the back of the infant, so that the extended thumbs may aid, as far as possible, in sustaining the vertex and inferior extremities; then, keeping the *ulnar borders* near together so as to form a fulcrum, the radial borders or sides are simultaneously depressed to as great an extent as practicable—say forty-five degrees—*below* the horizontal line, and then gradually pronated or elevated to as many degrees *above* that line, thus facilitating the escape of air drawn into the lungs during the downward movement of the head and chest. Or the hands are placed as at first, and passed *beneath* the body of the child,—on its back; and the superior and inferior extremities farthest from the operator seized, one by each hand, near the trunk,—the *ulnar borders* of the hands and wrists forming the fulcrum,—the head of the child being kept at a proper axis with the movements of the chest by the hands of an assistant, and the depression and elevation of the head and lower extremities proceeded with as already described. These alternate depressions and elevations of the two extremities, performed in a regular and gentle manner, and repeated at proper intervals, seldom fail in establishing respiration where it is possible of accomplishment. The occasional dashing of cold water on the epigastrium during the *descent* of the head and chest

will hasten respiration where the first few movements fail in its establishment. It is important that the head be kept, as far as practicable, from too much *lateral* movement, and not permitted to depart considerably from its *antero-posterior* axis with the vertebral column during the continuance of the process. To this end, in a critical case, the hands of an assistant may be brought into requisition. The importance of these remarks will be apparent to intelligent readers on a moment's reflection. No impediment should be *permitted* in the way of *free entrance* of air into the lungs during the *downward* movement of the head. And it is scarcely less important that no obstruction should prevent the *escape* of air during the *upward* movement of the head and chest.—*Philadelphia Medical Times*.

AN EASY METHOD OF REMOVING A PART OF THE INFERIOR DENTAL NERVE WITHIN THE LOWER JAW.—Dr. John S. Hodgen reports (*St. Louis Med. and Surg. Journ.*, Jan. 1875) the following case and method of operation:

"In July, 1874, Mr. B., aged 62, of robust constitution, having had uniform good health, presented himself, complaining of intense paroxysmal attacks of neuralgia. The site of pain was the gums, teeth, and bone of the right inferior maxilla. Some of the back teeth had been drawn years before for the relief of toothache, and others in front, with the hope of relieving the pain of which he now complained. About two years before he called on me he first suffered with this paroxysmal pain—the seizures occurring every few minutes, and so intense that he could not sleep or work during their continuance, but would express the intensest suffering by facial contortions. When in the cold air he suffered comparatively little, but warm air, or the heat radiated from a stove, or warm liquids in the mouth, increased the pain very greatly.

"There could be found no evidence of suffering at the termination of any of the other branches of the fifth nerve; the upper part of the face, the eye, and the soft parts of the inner side of the lower jaw supplied by the mylo-hyoid nerve seemed not affected.

"I determined to cut the inferior dental nerve.

"I first thought of cutting through the little alveolar process left at the back part of the body of the jaw, thus reaching the canal in which the nerve is lodged, but concluded that it could be better done, and further back, with a dentist's drill.

"This little drill is made to revolve with great rapidity by a system of pulleys; it cuts rapidly and accurately.

"With a strong knife I made a cut one inch long, beginning on the inner side of the base of projecting ridge of the coronoid process, and running forward on the body of the bone to about the former site of the last molar tooth.

"The point of the drill was entered just in front of the base of the coronoid process, and directed downward, backward, and a little outward; in a few seconds the drill had penetrated the canal, as was known by the absence of resistance, the sudden twinge of pain, and the flow of blood.

"The small drill was then replaced by a globular bur one-eighth of an inch in diameter; with this the opening was enlarged until the nerve was again touched. The bur was now carried outward and inward, and then toward the posterior dental foramen; this last gave intense

pain. Now the bur could be made to touch every part of the wall of the space without pain; the blood flowed pretty freely when the canal was first opened, and was still flowing—a little cotton pressed into the opening into the bone, the bleeding at once ceased, and we left the patient comfortable and happy.

"For several days he suffered from nothing but soreness at the point of operation; two weeks later he called at my office suffering a little with the old pain; this, however, disappeared entirely, so that on the 21st of November, when we called on him to learn the finale, he was quite well, and has much improved in flesh.

"The object of this paper is not to add another to the many cases already detailed in which this painful affection, due to disturbances along the course of nerves, has been relieved by severing the nerve on the central side of the disease, but to call the attention of the profession to the great ease and certainty with which the severance may be accomplished. I am not aware that this method has been practiced before."—*Monthly Abstract of Medical Science.*

STATISTICAL REVIEW OF OPERATIONS FOR TUMORS OF THE SUPERIOR MAXILLA.—Dr. Ohlemann, of Bremen, has furnished (*Archiv für Klin. Chirurg.*, xviii., 2, 1875), in tabular form, the statistics of thirty-two cases of tumors of the upper jaw, where complete or partial resection was done. It appears that the entire jaw was removed fifteen times, and part of it twice for carcinoma. Five sarcomatous tumors classed as giant-celled, three as spindle-celled, one as round-celled, and one as medullary, were operated on. Cylindromata twice required partial resection; epitheliomata twice an almost complete resection; an enchondroma once a total resection. Out of twenty total resections there were three deaths and seventeen recoveries, while of twelve partial resections there was no death. Fifteen per cent., therefore, represents the total mortality. Dr. O. calls attention to the much larger proportion of carcinoma than of medullary sarcoma among these cases than in those of O. Weber. He finds that carcinoma is much more frequent in middle and advanced life, and is twice as frequent among men as women. He thinks that in some cases the tendency to the disease is undoubtedly hereditary. After the sixth month, the pain, inconvenience, and disfigurement make the patient generally quite ready to submit to an operation.

The ultimate result of the cases of carcinoma was fatal after an interval of from one to three years, the disease recurring in the cicatrix. Still, he considers that the operation should be undertaken in these cases, provided the disease be not so far advanced as to make it impossible to separate the diseased from healthy tissues, because it prolongs life and alleviates suffering. In cases of epulis, the operation, with the aid of Liston's forceps, has in all cases resulted in cure. The operation itself was generally performed with the patient sitting up, the head supported on the breast of an assistant, and it was the subject of remark how well so severe an operation was borne. The incisions in the skin had to be variously modified in view of the size and situation of the tumor; but it was found that some disfigurement, from sinking in of the cheek, and distortion of the mouth by contraction of the cicatrix, was unavoidable. The only exceptions to this were in two cases where the tumor grew in the direction of the nasal cavity, when.

Dieffenbach's incision was made use of with the best results, and in some cases where the growth sprang from the alveolar process, and no wound of the skin was required in its removal. Liston's bone-forceps were used for detaching the upper jaw from its bony connections, and Langenbeck's forceps for removing the loosened portions. After thorough removal of all diseased tissue, the wound was filled with carbolized lint, and the edges united with sutures. In the after-treatment it was thought very important to prevent the flow of secretions from the wound into the mouth, through the opening left in the palate. Antiseptic solutions were therefore assiduously used so that pulmonary complications should not be set up. Secondary hemorrhage led to a fatal result in two cases, and erysipelas also occurred, mainly owing probably to the bad sanitary surroundings in the hospital. Patients usually were able to leave the hospital, cured, after from two to four weeks. Dr. Ohlemann furnishes the details of seven cases, to illustrate various points on the subject.—*Medical Record*.

ON THE ACTION OF SALICYLIC ACID.—Dr. Winter, in a recent number of Schmidt's *Jahrbücher* (June 17th, 1875), in recording the different results obtained by the use of salicylic acid, remarks, in the first place, that this acid may completely replace carbolic acid as a disinfectant in recent and chronic ulcers when applied on the bandages. In several cases of recent superficial gangrenous sores, Dr. Wagner applied a thin layer of powdered salicylic acid on the surface, and placed over it some wadding. Sometimes the secretions of the sore passed through the bandage, which, however, was inodorous, and then another layer of wadding sprinkled with salicylic acid was laid over it. For the most part the bandage might be removed in a week, and the healing of the sore was accomplished; and Dr. Wagner, without denying the efficacy of the wadded bandage, attributes a great part of the successful result to the disinfecting properties of the salicylic acid. In atonic ulcers of the foot, an obvious acceleration of the granulating process was effected by a salve of salicylic acid and lard. Dr. Wagner has also employed this agent successfully in the form of gargle in ulcers of the gums, stomatitis, etc., and the foul smell from the mouth has been at the same time corrected. The same authority recommends the use of salicylic acid in all maladies which take their origin from minute organisms. In diphtheria the acid seems to display great efficacy and to shorten the duration of the disease very materially, and it may be given internally and also used as a gargle. Dr. Karl Fontheim has likewise employed salicylic acid successfully in diphtheria, using the remedy both internally and as a gargle.—*British and Foreign Med.-Chir. Rev.*

HINTS AND QUERIES.

WILL you please invite an expression of opinion in the DENTAL COSMOS upon the suitability of celluloid for lower plates? I have heard it condemned, but have never seen anything upon the subject in the journals.—T. B. L.

WILL some one well posted in electricity explain the working of Green's electric engine,—the course of the current from the time it enters until it leaves the machine?—S. L. W.

I MADE a set of teeth for a man fifty years of age; took the impression four months after the extraction of the teeth. Was careful, and obtained a satisfactory impression. After completion, the teeth seemed a perfect fit, being retained in place by perfect contact. The air-chamber is of medium size, near the center of the palate. After two months' wear, and frequent instruction, I have not been able to teach him to exhaust the air from the air-chamber. Consequently he has a great deal of trouble in masticating. The patient is of more than ordinary intelligence. Is there any remedy for the trouble?—SUBSCRIBER.

THE following are the leading features of a case of intractable disease of the gums, in the treatment of which all the accepted methods with which the writer is conversant have been tried without avail, and touching which some suggestions are solicited from those familiar with the subject.

Mrs. H., aged about forty-five, married, of bilio-sanguine temperament and almost unvarying good health, noticed about a year since a peculiar flaming-red condition of the lower gums (upon the labial aspect only), and limited by the second bicuspid upon either side.

Upon close examination the mucous membrane is found detached from, but in close contact with, the fibrous structure beneath, subject, however, to a sudden elevation by an exudation of bloody serum, which in a *few moments* will develop a large blister, varying from a quarter to an eighth of an inch in diameter, the contents of which may, by gentle pressure, be forced along under the membrane a considerable distance, or evacuated by a little more violence. These blisters will oftentimes present themselves singly or in clusters in a moment, and, when discharged, will reappear in as short a time. For days or weeks they may be constant, or absent for equally short or long periods, but the angry red appearance is ever present.

The physical inconvenience experienced is slight, smarting or tenderness resulting only from the contact of some of the irritant fluids used as ingesta, such as vinegar, salt, etc.

The disease, during the last five months, has manifested itself upon the labial aspect of the upper gums, limited, as below, by the bicuspid, and also upon the lingual margin of the lower jaw, although in the latter location less aggravated.

All the various astringent, alterative, stimulant, and antiphlogistic measures have been locally addressed, while greater importance has been attached to the correction of a supposed disordered state of the upper part of the alimentary tract, of which this condition was adjudged to be a local manifestation, but without response. Antiscorbutics have been faithfully tried, with equally negative results. Alkaline and acid treatments have been empirically tested, and successively voted useless. A week or two since I conceived the idea that applications to the partially devitalized mucous membrane were of no avail, and removing a portion with the scissors, applied a strong solution of chloride of zinc, but inspection a day or two since reveals the old condition.

I detail thus briefly the general management of the case, in hopes that some new and efficient hint may be offered. In conclusion, I would observe that the mouth is ordinarily free from salivary calculus.—E.

REPLY TO Z., IN NOVEMBER DENTAL COSMOS.—I think if Z. will saturate with carvacrol the bit of cotton he is to use before he places the arsenical paste upon it, he will have very little trouble from odontalgia. He says he had the same trouble with pulps that have never ached before. Would it not be better to save such pulps alive?—ZIBBIE.

REPLY TO Z., who asks, in Hints and Queries of November DENTAL COSMOS, "How can I avoid the difficulty of odontalgia sometimes attendant on the treatment of pulps with nerve-paste? Have noticed this trouble with pulps where there has been no previous aching. Is it the result of congestion, and to be treated as such?"

First, avoid the pain by avoiding its cause,—compression. Cover the nerve-paste and pulp by melting wax over them, which, flowing into the cavity and hardening, afterwards obviates the pressure, which is the cause of the pain. Never use sandarac and cotton or gutta-percha, as pressure and pain are almost certain to follow their use.—J. H. WARNER, D.D.S., *Columbus, O.*

ANSWER TO DAVID MARSHALL, IN NOVEMBER COSMOS.—I experienced the same annoyance complained of by Dr. Marshall, when I first began the use of celluloid, and after repeated efforts to obviate the difficulty, I came to the conclusion that the air-chamber was in some way the cause of the trouble. I therefore abandoned the use of the air-chamber. I press my plates on the *naked* cast, and cut the chamber in the plate after it is taken from the flask, which can be done with the engine in five minutes. Since I have adopted the above plan my plates come out perfect. The "dark line or fissure," spoken of by Dr. Marshall, is really a defect in the plate, which becomes more apparent after having been worn for a time.—JAS. M. STEWART.

PLEASE say to David Marshall that the trouble he mentions (Hints and Queries, November DENTAL COSMOS) comes from a lack of material to fill the mould; either his "trial-plates" are too thick or the selected disk too thin. The fissure is the result of a folding of the celluloid in bringing the flask together; pressure being brought first upon the sides, the material is carried down in form of a fold.—E. D. S.

REPLY TO DR. S. MUSSELMAN, who relates, in the November DENTAL COSMOS, the unsatisfactory results he has had with gold in filling a tooth for a young lady, and asks for suggestions as to the cause of the failure, etc. I refer him to an article in the *Dental Miscellany* for October, by Dr. S. B. Palmer, entitled "Success or Failure in Dental Operations Chemically Considered." The article referred to will, I think, show that the cause of failure was electro-chemical decomposition. The gold, being a good conductor, caused the decomposition to take place. The filling was not affected, but the tooth had to suffer.

On the other hand, when he filled the tooth with os-artificiel, it did not decay, because it was in harmony with the tooth-structure, being a non-conductor, and consequently electrical decomposition did not occur as with gold. Now, if he will fill the tooth with tin, or tin and gold mixed, it will be preserved, and when the patient is older and the tooth less vascular, it can be filled with gold successfully.—F. E. HOWARD, M.D.S., *Geneseo, N. Y.*

DR. S. MUSSELMAN's opinion, that pressure was the cause of the failures in "a case in practice," recounted by him in Hints and Queries, DENTAL COSMOS, November, I think is not correct. Certainly the conclusion that the condensing of the gold makes a wedge of the filling is a mistake, especially of cohesive gold, which must have been the kind used by the writer if "annealed just before using."

It is impossible to produce any considerable pressure with cohesive gold in any direction other than that produced directly under the foot or point of the instrument. The failure in the case referred to was more probably the result of *imperfect* condensation of the gold against the lateral walls of the cavity, and especially

around the margin when the operations approached completion. One evidence of this fact is stated by the writer, viz., that the cervical wall (which must have received the greatest amount of pressure, and against which the gold must have been more perfectly condensed, owing to the position of the cavity) was found to be unchanged. I will venture that had the writer subjected his fillings to the ink-test, he would have found the above the correct theory. Experience and close observation teach that the most common cause of the failure of gold fillings to preserve the teeth is their imperfection or porosity next to the walls of the cavities. For unless the fluids of the mouth are excluded, caries will ensue. To insure a perfect operation of course includes a proper preparation of the cavity: cutting out all angles around the margin, leaving the contour a curved line, and beveling the edges; then as the operation approaches completion the force will be against the beveled portion of the walls, and insure a more perfect union.

—REX, *Lincoln, Nebraska.*

REPLY TO S. MUSSELMAN, DENTAL COSMOS FOR NOVEMBER.—Your experience, though unusually marked, is not very uncommon. You filled mesial cavity of inferior first molar, using an automatic mallet, and packing from the direction of the grinding surface. It is evident that you accurately adapted the gold to the cervical wall, and that you failed to prevent leakage at the lateral walls. *Gold must be packed directly against any wall, or the adaptation will be imperfect;* hence the unwisdom of eschewing hand-force for packing against walls that cannot well be reached by mallet-force. This is an extremely important point, and one that, unheeded, may account for a very large proportion of the failures, more or less marked, occurring in the practices of even reputable operators.—J. S. LATIMER, D.D.S.

PIVOT-TEETH.—Having had occasion, within the past year, to set several pivot-teeth, I have adopted a plan which seems to be a success, although the time has been so short that the durability of the method has not been proven by the actual wear of these cases.

The process may be familiar to and practiced by many, but I do not remember ever having seen it published.

After adjusting the rubber dam, the root is shaped in the same manner as though a tooth was to be set in the ordinary way. The nerve-canal is then enlarged as much as possible, without sacrificing too much strength. The cavity should be left somewhat irregular, or with slight undercuts. The enlargement should be made much greater in proportion at the external end of the root than towards the apex. The cavity is now filled with adhesive gold, with great care in condensing, so that it may be as strong as possible. The filling is brought down until the entire face of the root is covered so as to leave a plate of gold when finished, about number 22, United States gauge, over the surface. The gold is then finished down to the proper shape to receive the pivot-tooth crown. After fitting an ordinary pivot-tooth, spread a thin coat of wax on the gold, and press the tooth against it, and the impression of the tooth in the wax will show where the hole is to be drilled for the pivot. The hole is then drilled to the depth and size required. This would be a slow process by hand, but with the engine it is quickly done. The tooth is now set with an ordinary wooden pivot, and the operation is completed.

The operation presents to my mind several points of excellence, the greatest of which seems to be the entire protection of the end of the root from decay. If the gold is properly put in and brought down over the end, I do not see why we may

not expect the root to remain in a sound condition. Again, roots that have been pivoted several times, and the canals much enlarged, or the ends more or less broken down, may sometimes be restored to usefulness, thereby obviating the necessity of wearing a plate. If the pivot breaks, it can be easily replaced. The operation is not a complicated one, the necessary materials are always at hand, and the expense to the patient is less than by the more elaborate methods.

It may be suggested that it is unnecessary to fill the root entirely with gold, and that a wire of proper size might be put in the cavity and the gold impacted around that, and afterwards the wire removed to form the pivot-hole; but the gold can be condensed more perfectly with plenty of room to do it in, and with less danger of splitting the root; and as much of the strength of the operation depends on the solidity of the gold, it is of importance that it be put in as well as possible.

The above are general hints of the method I have tried with apparent success. The ingenuity of the operator must be the guide in each particular case.

A word as to the best way to adjust the rubber dam in these cases. When the crown of the tooth remains it is easy enough, but when it has been cut off or is decayed to the gum it is much more difficult.

Punch the hole in the rubber as small as possible, but large enough to stretch over the root without tearing. Then take a pair of extracting forceps with the beaks nearly as wide as the tooth to be covered. Stretch the rubber over the closed beaks of the forceps, then open them enough to slip on to the root as if to extract it, and let an assistant hold them while the rubber is being carried from the forceps on to the root and the ligature adjusted. If the string has become wet while being put in place, dry thoroughly and then saturate with sandarac varnish, and hold in position for a few minutes until the varnish becomes dry, when it will be found securely fastened in place. Sometimes two or three Mack's screws may be put into the root to hold the rubber, but this weakens it more or less, and should be avoided if possible.—DWIGHT M. CLAPP, *Boston*.

CAPPING DENTAL PULPS.—Having studied the profession of dentistry in this place, and been in practice here since 1852, I have had ample opportunity to watch the results of my own operations for twenty-three years.

My first experience in filling over exposed dental pulps was in 1855. Mr. S. presented with a central and a lateral incisor decayed on the proximal surfaces; each pulp was slightly exposed, but had never pained him. Having applied chloroform, I folded a piece of foil sixteen thicknesses, and placed it over the exposed pulp in one of the teeth, and then filled in the usual manner. As this caused no pain, I proceeded in the same way with the other. The six upper front teeth were the only ones requiring filling at that time. Seventeen years after, these teeth were the only ones remaining in the jaw, having given him no pain until about a year before, when the teeth had broken and the fillings dropped out.

I have since used various substances,—quill, horn, vulcanized rubber, Hill's stopping, and os-artificiel. I once filled a tooth with tin, placing the metal against the naked pulp in the same manner as described with gold. Four years after I removed the filling, in consequence of a fracture, and found the pulp in a healthy condition.

All these procedures, however, have their respective disadvantages. I finally hit upon my present mode of treatment, and wondered that I had not devised it before.

First remove all the softened dentine, and shape the cavity, being careful to wound the pulp *as little as possible*; if wounded so that it bleeds, apply creasote,

or better, chloroform or alcohol, to stop the hemorrhage and ease the pain. The cavity prepared, take a piece of No. 4 gold foil, non-cohesive, fold eight or sixteen thicknesses, according to the size of the exposure, and large enough to cover all that portion of the cavity where the pulp is nearly or quite exposed; have ready some sulphate of morphia dissolved in creasote to the consistency of new honey. Dip a small pellet of cotton in it, and moisten the exposed pulp and dentine as far as the contact of the os-artificiel would possibly cause pain. Place the folded piece of gold, and press it home with a pellet of cotton or bibulous paper,—gently at first, giving any excess of the creasote and morphia opportunity to escape without being forced into the pulp-cavity. Prepare the os-artificiel as stiff as for temporary fillings, introduce and press as firmly as desired.

The foil having been got in readiness, and the excess of os-artificiel removed, the remainder will be sufficiently set to commence introducing the gold.

I have filled teeth in this manner for the past fifteen months, and have learned of only one patient suffering pain after the application of the creasote and morphia, and of only one who complained of soreness. In this case the pulp was inflamed and the tooth sore to the touch when filled.

It is not advisable to apply more creasote than merely enough to moisten and cause the foil to adhere.

The gold prevents the os-artificiel acting upon the pulp or sensitive dentine. The same treatment will save much pain to the patient and danger to the pulp in cases where decay has advanced so far as to require a non-conductor for the subsequent comfort of the patient.—ISAAC DOUGLASS, D.D.S., *Romeo, Mich.*

A CASE IN PRACTICE.—Miss S. presented herself at my office for the insertion of a superior denture. She had previously consulted several dentists, but could not induce any of them even to *try* to fit her with a set, on account of the difficulties of the case. A few years since she had been successfully operated upon by Prof. Gross, of Philadelphia, for cancer, which had involved the right cheek, extending along the lip nearly to the nose. In healing, the wound had produced a hard, unyielding cicatrice, and considerable deformity. The first two fingers of my hand were barely admissible at the orifice. Of course the smallest impression-cup would not pass into the mouth, and if it had a fair impression could not have been obtained. I puzzled over the case for awhile, until the thought suggested itself of taking the impression in sections, which was successfully done. At first as much plaster was introduced with a spatula at one side of the mouth as could, when hardened, be readily removed. This was trimmed, key-holes made at the side, and oiled, and then replaced in the mouth. While it was held firmly in place more plaster was added at its side and allowed to harden. These were easily separated in the mouth with drawn-in sections and by means of the key-holes fitted together outside the mouth to form a perfect impression. Three sections were necessary. Some anxiety was then felt lest after the plate was made it should fail to pass in and out of the mouth readily. This difficulty was obviated in part by allowing only a small margin of rubber to extend over the margins of the gums, but chiefly by arranging the teeth on the plate in a somewhat contracted arch. The lady wears the set with perfect comfort, and many are the blessings she calls down upon me for my success in fitting her mouth through the exercise of a little ingenuity.—W. G. PHELPS, D.D.S.

DENTISTS have doubtless been annoyed by the hand-piece of the engine becoming unscrewed when it is turned backwards, as it always is when standing upon the left side of the chair. This can be easily prevented by making a washer of one

or two thicknesses of rubber dam, placing it upon the screw so as to come between the joints in the hand-piece; this keeps up a constant pressure, and will effectually prevent it unscrewing while operating.

A small piece of rubber placed in the socket of either the engine mallet or the Snow & Lewis automatic mallet will aid materially in keeping the points in place; when screwed into the socket, the rubber being above the part of the point in the socket, keeps a constant pressure upon it, and thus prevents its unscrewing accidentally while in use.—G. W. K.

UTILIZING SCRAP WAX.—I have tried several plans to use up my scrap wax by making it into thin sheets; with none of them have I met with the desired success until I tried the following, which I think the best and quickest way. First cut off the soldered end of an ordinary oyster-can, melt the wax in any suitable vessel, have prepared a number of strips of glass two or three inches wide and five or six inches long, pour the molten wax in the oyster-can, have a bucket of water near at hand, dip one end of the glass in the wax, then in the water, remove the water from the wax by pressing against a towel or napkin held in the left hand, repeat the operation until the plates are of the required thickness, trim the wax from the edges of the glass, remove the plates, and they are ready for use; too much balsam of fir inclines the wax to stick to the glass.—W. G. O.

BASE PLATES.—J. H. S., in the November number of the Cosmos, page 615, gives a method of making base plates. Another way, and with little expense, is to procure a couple of *jelly-cake pans*,—those used by the ladies for making ribbon-cake. Place a few drops of mercury on each pan, and with a sponge rub over the surface. The tin being amalgamated, the melted wax will not stick to it. Next melt the wax in the usual manner, and pour into the pans; when cool, remove, and cut in strips about two inches wide. When all the wax is thus prepared, get out your wife's clothes-wringer, and fasten it to a bench or other suitable place. Prepare a pan of lukewarm water, and put in strips of wax, moisten the rollers, and you can *wring out your wax* as thin and even as you desire. Occasionally add a little hot water to that in the pan to keep it *lukewarm*, and keep the rollers moistened. Old wax or new wax may be reduced to base plates in a short time in this way.—R. P. LOCKWOOD, Franklin, Ohio.

O. U., in November DENTAL COSMOS, speaks of a young lady of sixteen erupting the dens sapientiæ as an early development; I erupted mine in my thirteenth year.—A. M. K.

LONDON, November 30th, 1875.

TO THE EDITOR OF THE DENTAL COSMOS.

SIR,—In the notice of "Vernon Galbray," signed "W.," in your last number, it is stated that the pamphlet "turns out to be itself a cunningly devised advertisement of a well-known dental depot." And the writer avowedly draws this conclusion, as he states, from "a certain paragraph slyly inserted at the very end."

As in the paragraph referred to the name of Claudius Ash is mentioned, we think it right to say that this firm is in no way concerned, either directly or indirectly, with the publication of this pamphlet. Our first knowledge of it was from receiving a copy by book-post, sent to us anonymously, and up to Saturday last, the 28th inst., we were in ignorance of its authorship.

We trust you will do us the justice to insert this in your next issue.

We are, sir, yours faithfully,

CLAUDIUS ASH & SONS.

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, FEBRUARY, 1876.

No. 2.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

(Continued from page 6.)

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

BEFORE entering into the considerations which govern practice in relation to each temperamental subdivision, it will, I think, be advantageous that we generalize briefly concerning the special attributes of each grand division, as by this means I hope to make the complications of my dento-temperamental group so easy of grasp as to render it, comparatively, not difficult to appreciate such modifications as must necessarily pertain to the usual "ternaries" which, it must be admitted, form the mass of humanity.

To the *bilious base* is ascribed, in one word, strength.

The concomitants of this attribute are endurance, persistence, capability, permanence, and the like, with solid but stolid mental endowments.

To the *sanguine base* are ascribed volume of nutrition, reliable recuperation, *hopeful aspirations* (from molecular to systemic), together with solid, but florid, mental endowments.

To the *nervous base* are ascribed all attributes which relate especially to *quickness* and *frequency*; thus we have that irritability of all tissue which produces quick response, with frequent repetition.

With quickness of motion, therefore, we have the concomitants of quickness of assimilation, excretion, recuperation, and other desirable functional action; but, on the other hand, have to recognize the liability of equally quick deviations in undesirable directions.

For mental endowments we have generally quick perception, with, however, facility rather than reliability,—rapidity rather than persistence.

To the *lymphatic base* are ascribed general physical and mental attri-

butes, which may be somewhat peculiarly, but perhaps none the less significantly, denominated *bulky*; organs, muscles, and bones are large, but possessing neither density, quality, nor strength; mental endowments are, in kind, *bulky*, but neither brilliant nor powerful; action is slow and easy; recuperation tardy and feeble; degeneration liable; perception not quick.

Although it is of necessity but a meagre review of temperamental attributes which can in this connection be presented, I think that the very conciseness for which I am in a manner apologizing may perhaps be none the less desirable, from the fact that the salient points may thus more readily be appreciated and utilized.

With these prefatory remarks, therefore, we will discuss,—

1. *Bilio-sanguine*.—It is with feelings of admiration and respect, not unmixed perhaps with a tinge of envy, that I approach the consideration of this splendid temperament. When one reflects upon the combination of a base of such beautiful physical and desirable mental endowments as pertain to the sanguine temperament, modified, intensified, fortified, *strengthened*, by admixture such as has been ascribed to the bilious temperament, it is impossible to conceive of a higher, grander, nobler type than the *possibilities* which may here be reached. A Solomon in all his glory, wisdom, and power would fitly represent this first, best temperament; and yet by him we are taught that all of this is only human, and that opportunity and excess will surely bring the sad reflection that “all is vanity and vexation of spirit.”

The physical attributes which indicate *bilio-sanguine* are, generally markedly more than average size (height is not *particularly* referred to in this attribute, but *size* generally, breadth of shoulders, fullness of chest, size of limbs, etc.),—well-rounded muscularity in the male, and firmly-rounded, harmonious development in the female.

The hair very dark, but not black; much more than wavy, but not shortly curly; luxuriant in quantity and desirably fine in quality; the eyebrows decided in their marking and arching; beard full and well planted; eyes dark, large, lustrous, and expressive; mouth moderately large; lips full and red; nose shapely; cheeks round and glowing with the richest hue; skin smooth, soft, and creamy-tinted in its fairness; and all the special senses strong and redundant of capacity in the performance of their varied duties.

With such a physique, great efforts are made with all apparent ease; great results are accomplished, seemingly, as matters of course; grave lesions are comparatively powerless for harm; and the *vital force* seems equal to any emergency.

With teeth which share in common the blessings of such an organization, the gradual progress of caries, until it has eventuated in an “almost exposed pulp,” is really not so serious a matter.

Gradually the warning ache has become more and more pronounced ; gradually the need for powerful irritation, as an excitant of pulp response, has lessened, and *moderate* heat or moderate cold, moderate sweet or sour and moderate pressure, are enough to cause vastly more decided pain.

It may be that very near approach of decay to pulp-structure has at length given rise to continued odontalgia, even with quite intense paroxysmal exacerbations, and these may have been quite numerous and extending over a period of many days, *and yet* the mild application of a little *moistened precipitated chalk*, or a little *bicarbonate of soda*, a part of a drop of *oil of cloves* on cotton, or even the shutting out of external irritants by the introduction of a cotton-wool pledget, without any medication whatever, will suffice to quiet all pain, and will permit the pulp to take on, for the present, that healthy action which, if insured in continuance by a proper stopping, would in a short space of time re-calcify the thin stratum of softened dentine still covering it, and in due season provide the secondary dentine necessary for the maintenance of future normality.

More than this, it may be, that, after excavating, a well-impacted gold-foil filling of great conductivity may be introduced ; and, notwithstanding all the thermal irritation which must ensue as this pulp is shocked by repeated hot and cold applications for weeks and months afterwards, still it will slowly gain ground, and will finally cease to respond, *because it has maintained its integrity*, organized its protective barrier, and proved itself victorious over combined disease and want of judgment.

More than this, even, during the progress of dental manipulation all of the remaining covering of dentine may have been swept away, and a fairly exposed and wounded pulp may have been thus closed in *and still survive*.

This is not a result of frequent occurrence, but such things have been, and serve to illustrate what *may be* when "nature" draws from resources which, *until death*, seem inexhaustible.

And this last thought presents us with the other view,—the view which shows how strength may be itself its greatest foe ; for in the *sudden death* which sometimes blasts our hopes, we recognize that sthenic fury which, with one impetuous paroxysm, whirls to a degree of motion incompatible with organic life.

With such teeth, then, it is taught that ordinary precaution will produce seemingly extraordinary results, that a favorable prognosis may be indulged in, and that we may attempt, with every hope of success, the operations which will hereafter be described as performed for the purpose of saving the vitality of "almost exposed pulps."

Sanguo-bilious.—While we have in this combination an excellent temperament, dentally, it is nevertheless not so promising as the first

upon the list. The dominating power here is bilious, and the modifying control is sanguine; hence it is that, as in general disease, so in dental, the depressing tendency concomitant with bilious pathology takes the place of the hopeful aspirations which seem to be maintained almost beyond credence in connection with sanguine abnormality; and yet the recuperative stamina of the basal temperament so receives the favorable impress of its associate, that it deservedly stands only second in a long line.

The physical characteristics of the *sanguo-bilious* temperament are, generally more than average size; but a *tendency toward* angularity, rather than rotundity of form, is pronounced alike in male and female; strength predominates over beauty, and *decision* of development takes the place of harmony.

The hair is more decidedly black; is *generally* more curly, and is coarser; usually not *luxuriant* in quantity, but exceptionally so; the eyebrows are decided, but usually more straight than arched; the beard is *universal* rather than handsomely set; the eyes very dark or black, average size, and rather strong than lustrous in expression; the lips are average in size, incline to large, but the epithelium is of a brownish-red, which increases in darkness with age; nose large and decided in contour; cheeks broad, and possessed of but little color, except during excitement; skin fairly smooth, but dark and yellowish in its tinting.

The special senses are strongly developed, especially the deeper ones of sight and hearing. In like manner we find the nutrition of the teeth, dependent as it is upon the deep-seated fifth pair, largely provided for.

Thus it is that we have in patients of this class those strong, well-organized, durable teeth which second our efforts nobly, from the simplest crown-cavity filling—which, reasonably well done, lasts almost or quite a lifetime—to the satisfactory results which usually follow any tolerably well-directed attempts toward alleviating conditions quite in the depths of dental pathology.

2. *Lymphatico-sanguine*.—With this temperament the dentist would begin to enter “troubled water” were it not for the fact that the teeth of this class are usually so good that, when occasionally one does decay so as to approach a pulp, there seems to be some organic peculiarity which singles it from among its fellows; and, while through this peculiarity decay is permitted, it is at the same time rendered amenable to treatment.

The signs indicative of this temperament are, average size; fair, but not marked physical development; light-chestnut hair, decidedly inclined to curve; eyebrows dark chestnut, and sufficiently arched; beard generally well planted, but not heavy; eyes gray-blue and expressive; mouth medium, and oftentimes beautifully shaped; lips dark pink; nose

usually very shapely; cheeks round, slightly full, and handsomely tinted; skin very smooth, soft, and ranging from ivory whiteness to light pink; special senses, average.

We have in this temperament the pleasing combination of the basal nutrient, reliant, recuperative, and hopeful components of the *sanguine* modified by the soothing, quieting, and rounding control of the *lymphatic*; and thus we have, in the conduct of the teeth during treatment, the *local expression* of the happy influence which governs the entire system.

It is true that *gentle* medication may advantageously be indulged in, for the sanguine tendency is toward complications of circulation,—*toward* that condition which we recognize as *inflammatory*; and we (as dentists) should persistently combat all such indications, and steadily keep in view the substratum of pathology (Atkinson), that *any deviation from normality is undesirable*, and every grade from health toward inflammation more and more decidedly objectionable.

It is thus, then, that soothing medication may, in lesions so grave as that of an “almost exposed pulp,” be acceptable to the irritated sensibility of an organ so abnormally conditioned; and for this reason I now, in this first temperament of my second division of dento-temperamental classification, suggest as advisable, and perhaps desirable, the employment of other slight precautionary measures than those which will be hereafter given as purely manipulative.

Lymphatico-bilious.—In this temperament we have, as distinguishing physical peculiarities, the same *relative* differences as exist between the bilio-sanguine and the sanguo-bilious of the first division; and here we notice the first apparent complication of temperamental pathology; for it would seem but natural that lymphatico-sanguine should be followed by sanguo-lymphatic.

It will, however, I trust, be made practically clear, as we progress, that these two temperaments are widely different in all their various phases.

The signs which mark the *lymphatico-bilious* type are, decidedly more than average size; hair very dark and wavy, and inclined to coarse; eyebrows marked and heavy; beard full and wavy; eyes dark, and usually strong; mouth large; lips usually firmly set; epithelium brownish; nose large, with breadth; skin dark colored, not smooth, and with tendency toward ephelides, chloasma, moles, etc.; special senses, average.

With teeth of patients of this class we have also much in favor of success in saving the vitality of “almost exposed pulps,” for to the natural strength of the *bilious* temperament we have added the steady influence of the lymphatic.

This condition, instead of producing any of the deteriorating effects

which might be supposed to follow the admixture, seems to evoke a peculiar *resistance to infringement* on the part of the individual, which is maintained in the organs and tissues, and manifests itself repellent of "disease."

To this persistent determination we can ascribe not only the apparently superhuman results of the efforts of such individuals, but also the wonderful recoveries from serious pathological conditions, the credit for which is not unfrequently appropriated by the physician, surgeon, and dentist alike, as evidence of surprising skill!

(To be continued.)

DENTAL EDUCATION.*

No. 7.

BY ROBERT ARTHUR, M.D.

It has always been inexplicable to me how any person who has given serious attention to the subject of dental surgery should question its claims to the position of a specialty of medicine. By being based upon medicine, or making one of its specialties, is meant, merely, that the province of dentistry is the management of certain abnormal conditions of important parts of the human body, not clearly to be comprehended unless studied by the light of the general principles of medicine. What this term means was briefly explained in the last paper. It is obvious, then, if the general principles of medicine constitute an essential feature of a dental education, that they must form a part of the curriculum of a dental college, or the instruction afforded by it must be so far deficient. We come, then, to the inquiry as to the amount and character of instruction of this kind furnished by existing dental colleges. In making this inquiry my information will be drawn from the statements with regard to the course and facilities of instruction of these schools made in their annual announcements.

I will, for the purpose in view, select three of the existing colleges which may be regarded as fairly representing the whole number,—viz., the Dental School of Harvard University, and the Philadelphia and Pennsylvania Dental Colleges.

It may be premised that in none of the three schools named is there any professorship of general or special pathology. These subjects, so

* *Erratum.* Some errors were overlooked in reading the proof of the last article of the series, one of which is important enough to require notice. On page 9 I am made to say that the teeth when lost can be "replaced so as *more* perfectly to perform the functions of their natural predecessors." I meant to say "*very* perfectly."

far as they are taught, are in connection with other branches of instruction.

On examining carefully the announcement of the Harvard Dental School for 1875-76 we find, as I shall presently show, that the only member of the faculty to whom we can look for instruction upon the subjects which now occupy our attention is the Professor of Surgery. A course of lectures on surgery, I need scarcely say, necessarily demands large excursions into the field of general and special pathology; and such a course would, in a great measure, supply the wants of a dental student in this respect. But, on referring to the "daily order of exercises" in this school, it appears that there is but one lecture of this subject during each week, and one clinic. One of the advantages claimed to be offered by this institution is its connection with the regular Medical School of Harvard, and the Professor of Surgery—whose name is given in the list of the dental faculty—is attached to that school. But the regular course of lectures on surgery necessarily demands more time than this; and it would, therefore, appear that the dental student attends but one out of the three or four lectures delivered weekly by the Professor of Surgery. This is no doubt attributable to lack of time on the part of the dental student, his hours during the days of the session being occupied with appropriate duties. The dental student, then,—as would appear from the above statement of the provision made for his instruction in the principles of surgery, embracing as it does broad features of general and special pathology,—is able to attend a partial and intermittent course only upon the subject.

The connection of dental colleges, so far as it now exists, with medical schools, is necessarily of a most defective character, as the dental student, even if the whole medical course were open to him, has no time to give to it. Anatomy, physiology, and chemistry, I have no doubt, are more thoroughly taught in the wider course of a medical college, with sufficiently able teachers of these branches, except in some particulars, than in any dental college with which I am acquainted.

But in the Harvard dental school provision, it is stated, is made for instruction in the general principles of medicine by the professor of "Dental Pathology and Therapeutics."

On again referring to the plan of instruction, it will be found that but one lecture each week is devoted to dental pathology, and one every other week to dental therapeutics. I have shown, in a former paper, that the subject of dental pathology alone is one of such wide range, and deserves such thorough treatment, that it must occupy all the time of one individual if he delivered three lectures weekly during the winter course.

It would, therefore, be impossible that this subject could receive adequate treatment even if the three lectures, every two weeks, were

devoted to it exclusively, leaving out Therapeutics, during the winter term. This teacher obviously then could not possibly, no matter how competent he might be, give adequate attention to the subject of general pathology.

This it is not professed to do broadly, but, under the heading of "Dental Therapeutics" in the announcement, it is stated that—

"The instruction from this chair embraces the application of the general principles of medicine to the specialty of dentistry, with a consideration of sensitive dentine, caries, pulpitis, periodontitis, alveolar abscess, gingivitis, necrosis, and other diseased conditions of the dental and contiguous tissues, with reference to their treatment and the therapeutical agents used therefor."

This it must be agreed is a very comprehensive set of subjects to be managed in a bi-weekly course of lectures of nineteen weeks,—that is, in nine or ten lectures. The subject of "dental pathology," however, has associated with it the "origin and development of dental and adjacent tissues," with instruction in "microscopy as applied to dental histology;" and all this is to occupy but nineteen lectures.

I am anxious to do no injustice whatever to any institution in the examination I am making, and shall deal with the utmost impartiality with all those it becomes necessary to notice in order to accomplish the object I have in view. The advanced course pursued by Harvard University with regard to medical instruction has led to the most hearty commendations of the medical profession in various parts of the country. The course of instruction commencing in September, 1876, prescribed for the dental school, on the recommendation of the faculty, is a great advance, and should lead to the approval and support of such an institution by members of the dental profession who have at heart its real advancement. By this new arrangement the time of the course is extended to the whole scholastic year. This removes to a great extent the objections I have made to the insufficiency of time provided for instruction in the subjects to which I have referred, and, being aware of the important change about to be made, I have directed attention to it in order to show how obviously inadequate has been the provision made for thorough instruction in most important branches, even in a school to which credit has been generally and justly given, for an earnest desire to improve the standard of dental education.

But even under the new arrangement, to which I may probably give some further attention before I have completed these articles, no provision, so far as the statement of the required examinations shows, is made for instruction in general pathology. The only examination bearing upon the subject is that of "Surgical Pathology." This, however, if the instruction in this direction is sufficiently broad, is, it must be admitted, a great advance upon the present system.

I will now turn to the "Philadelphia Dental College," on the first page of the announcement of which it is said that—

"It is a source of satisfaction to the faculty to be constantly in receipt of letters from the alumni of the college, stating that on returning to their homes, in our own and foreign lands, they have met with the most gratifying success in practice, which they attribute to the superior facilities afforded at this institution for study and practical demonstration."

We should naturally look for provision to be made—in an institution so boldly claiming superiority,—for the broadest and most comprehensive curriculum. Let us see how far this is the case in reference to the subject now under consideration. One of the chairs is devoted to physiology, and the incumbent undertakes—

"The description of the structure and functions of the human body, and the best means of preserving health and developing the normal energy of which the various organs are capable will be presented in this department, and that practical application will be made of physiological and hygienic laws, which is so necessary to the comfort and well-being of practitioners and patients. Vivisections on the lower animals will be performed, so as to demonstrate the functions of the different organs. The development and growth of the dental organs, their intimate connection and functions, will be carefully described. To assist in the comprehension of this study, a large number of microscopical preparations and microphotographs with the aid of compound class and gas-microscopes and the stereopticon."

And now the question will naturally present itself, If all this elaborate attention is given to the functions of the human body in a state of health, and the great object of both medicine and dentistry is the study and treatment of morbid conditions, should not a corresponding amount of attention be paid to the subject of pathology and therapeutics? The only purpose, indeed, for the instruction in anatomy and physiology given in medical colleges is to prepare the student for the comprehension of morbid changes of structure and function; and if this object is not of the same importance to a dental student, an elaborate course upon these subjects would be thrown away upon him.

What provision then do we find in this school for instruction in the general principles of medicine? I have, in a former number of these papers, stated the subjects taught, and it was then shown that they did not comprise general or special pathology, except as relates directly to the teeth. All that is professedly taught on this subject is included in the course styled "Operative Dentistry and Dental Pathology," and is stated to be as follows:

"During the course it will be the endeavor to present such a general consideration of the principles of pathology and the practice of medi-

cine as is essential to the accredited causes and treatment of sensitive dentine, diseased pulps, periodontitis, dental exostosis, necrosis, and caries, together with many other morbid conditions which the practitioner of the specialty is called upon to alleviate and cure."

In numbers four and five of these articles I endeavored to show the importance of the very thorough consideration of the subject of operative dentistry in a dental college, and I also sketched some of the subjects necessarily embraced in such a course. The field, it must be admitted, is a very large one, and its thorough cultivation, as a preliminary to practice, second to none in the curriculum of a dental college. The wide range of subjects coming within the limits of this branch requires, I need not say, a great deal of time for their elucidation. Since the period when Prof. Elisha Townsend occupied the chair of operative dentistry in the first Philadelphia college great improvements have been made, requiring much time for their consideration. Dr. T., who was regarded as a very competent teacher, repeatedly declared that he considered the time allotted to him during the course of four months as too short to enable him to do full justice to his subject, although he devoted the whole of this time to it. A professor in one of the present schools stated to me that he was hampered in teaching this branch, because another subject demanding comparatively little time was associated with it. One of the objections made to a medical education in connection with dentistry, is that the time it absorbs during a winter course detracts from that which is necessary for the preparation of a competent operator. And yet in this college, claiming to offer "superior" advantages, this broad subject, with all its multiplicity of important detail, is not intrusted to one professor exclusively, but in addition this professor proposes to teach the "principles of pathology," (consider what this means) "and the practice of medicine" as it is applicable to dentistry. The question in this case is not as to the ability of the teacher, but it is simply, Can all these subjects be taught by one individual in the few hours allotted to him during a short winter course? It is evidently impossible. This must at once be admitted by any one who is familiar with the subject.

I have stated that no other provision is made in this school for instruction in general medicine. In connection with chemistry, however, some attention is given to materia medica, but the term therapeutics is not once employed in the "announcement." This subject, however, may be included in the course upon chemistry, as it is stated that it will treat of the "administration of remedial agencies," although I must declare myself unable to understand what this means.

No instruction in even surgical pathology can be looked for from the "professor of anatomy and surgery," who, so far as we can learn from the announcement, does not lecture upon that subject at all, and

gives no instruction with regard to it except what he may teach in the wards of the Philadelphia Hospital, which the student has the privilege of visiting once each week. What the student is likely to receive in the way of systematic instruction in the general principles of surgery—although the usefulness of these visits will not be disputed—need not be discussed.

Let us now turn to the Pennsylvania College, and ascertain what provisions with regard to the present subject of inquiry are made in that school. I would avoid reference to particular institutions if I could in any other way accomplish my purpose. But, as I propose to show what dental education in the United States is, and how far it meets the just demands of the dental profession, I must refer to particular organizations, and examine their provisions for instruction, in order to ascertain what is taught; and, as the curriculum is, with slight variations, somewhat the same in all the schools, the three I have selected fairly represent the whole number.

The whole of the subject of the general principles of medicine are in this school devolved upon the chair of "Dental Pathology and Therapeutics." Although the title of this department is very circumscribed, the incumbent gives it a wide range. He states that—

"The lectures from this chair will embrace general pathology, dental pathology, the pathological relations of the teeth to other parts of the system, together with a minute description of all special diseases that have any relation to dental surgery or are of interest to the dentist."

Now let us pause and consider for a moment what this programme embraces.

1st. General Pathology. What does this mean? "General pathology," says Chomel, "treats of diseases considered abstractly or in regard to that which is common to them all. It serves at once as introduction and sequel to special or descriptive pathology, whose end is the knowledge of each particular malady to which man is subject. It comprehends all that is most simple and all that is most elevated in science; on the one hand, the definition of terms and the description of the phenomena of disease; on the other, the discussion of all those fundamental questions and the exposition of those general principles which are to guide the physician in the arduous practice of a profession closely connected with the dearest interests of humanity. General pathology, consequently, comprises within itself the most unpretending elements and the most exalted philosophy of medicine.

"The definition of disease in general, and the mode of defining each one in particular; the nomenclature, seat, causes, and precursory phenomena of diseases; their symptoms, progress, duration, and various terminations; convalescence, consecutive phenomena, relapse, and recurrence; the distinction of genus, of species, and of pathological varieties;

complications, diagnosis, prognosis, anatomical changes, and treatment; the intimate nature of diseases and their classification."

No intimation is given of any reference to special pathology, except as relating to the teeth. But this is a subject of broad general character. A mere glance at some of the particulars it embraces, which would require careful exposition, and which cannot be said to be unimportant to a dentist, will show their great extent:

Diseased irritability; diseased tonic; diseased sensibility; diseased voluntary motion; diseases of the reflex and sympathetic nervous influence; diseases of secretion; anæmia; hyperæmia; plethora; local hyperæmia; inflammation, with all its great variety of phases; diseases of nutrition; hypertrophy; atrophy; induration and softening; morbid growths, non-malignant and malignant. This, I have said, is the merest glance at the subject of special pathology, and yet many, if not all the features noticed, if not absolutely necessary to the comprehension of diseases of the teeth and the parts associated with them, are at least essential parts of special pathology. It cannot be for an instant contended that any clear ideas of general and special pathology could be given in less than sixty lectures, which would comprise about all that are delivered by each professor during the winter course of a dental college. And yet, in addition to this great subject, the professor of "Dental Pathology and Therapeutics" in the college now referred to, besides dental pathology strictly, proposes to make "a careful examination of therapeutic agents and their general application, while their special uses in the medical and surgical treatment of diseases of the mouth, both idiopathic and symptomatic, will be fully illustrated. Special attention will be directed to the use of the various anæsthetic agents,—chloroform, ether, and nitrous oxide."

And yet, if this were not sufficient fully to occupy his time, he proposes to give "particular instruction . . . in the best methods of taking impressions of palatine defects, and the making of artificial substitutes for their correction."

What the motive may have been for laying out such an extensive programme, a practice not confined to this school, as I have shown, for the incumbent of this particular chair, may have been, I can only venture to suppose to be something like that of an intelligent and honest principal and proprietor of a young ladies' school with whom I had a conversation a long time ago. I asked him why he offered to teach such a large number of branches of knowledge, including, among many others, physics, chemistry, astronomy, ethics, moral and mental philosophy, the higher branches of mathematics, political economy, etc. etc. etc. He replied to the question, that, although he knew very well that neither he nor his assistants could teach these subjects, except in the most superficial manner, and, if they were fully capable, and could do

so in the time at their disposal, the girls under his care could not comprehend them, yet it was necessary to make this great display in order to meet competition and to maintain the existence of his school.

To say that some of the subjects referred to are superficially taught in dental colleges, would be giving a degree of dignity to the instruction offered which it certainly does not merit.

I have thus shown, taking three of the prominent dental colleges of the United States, what kind of pabulum and what quantity of it, in the way of instruction in the general principles of medicine, taking pathology as the most important feature, they furnish. Unfortunately, even if it be granted that any general medical instruction is unnecessary to prepare a dentist for practice, an important feature of this attempt to teach these general branches, even superficially, is that it is done at the expense of that technical instruction which it is so strongly contended, in opposition to broad general views of dental education, is its great essential.

I trust that what I am saying will not be considered as transcending the limits of fair and just criticism. It must be admitted that public and professional interests are paramount to the interests, and cannot regard the sensibilities, of those who profess to serve them, for their own private ends. They put themselves in the position of public servants, and must look for close scrutiny of their conduct as it relates to such a position. So far as they devote themselves faithfully and efficiently to the accomplishment of the important interests they have undertaken to subserve, they merit commendation and support. But if from any cause they fail to do this, injured interests will show themselves to be no respecters of institutions or persons, and will not fail to make earnest and persistent efforts to effect such changes as will remove just causes of complaint.

FACIAL NEURALGIA.

BY C. N. PEIRCE, D.D.S., PHILADELPHIA, PA.

(Read before the New York Odontological Society, December 21st, 1875.)

ANSTIE says, "Neuralgia may be defined as a disease of the nervous system, manifesting itself by pains which, in the great majority of cases, are unilateral, or one-sided, and which appear to follow accurately the course of particular nerves, and ramify, sometimes into a few, sometimes into all, the terminal branches of those nerves. These pains are usually sudden in their onset, and of a darting, stabbing, boring, or burning character. They are, at first, unattended with any local change, or any general febrile excitement. They are markedly intermittent, at any rate at first. The intermissions are sometimes regular, sometimes irregular, and the attacks commonly go on increasing in

severity on each successive occasion. The intermissions are distinguished by complete, or almost complete, freedom from suffering, and, in recent cases, the patient appears to be quite well at these times, except that for some short time after the attack the parts through which the painful nerves ramify remain sore and tender to the touch. In old standing cases, however, persistent tenderness and other signs of local mischief are apt to be developed in the tissues around the peripheral twigs. Severe neuralgias are usually complicated with secondary affections of other nerves which are intimately connected with those that are the original seat of pain; and in this way congestion of blood-vessels, hypersecretion, or arrested secretion from glands, inflammation and ulceration of tissues, etc., are sometimes brought about."

This general description of neuralgia is sufficient for the identification of the disease. When it is associated with malarial fever, malnutrition, and anæmia, periods of bodily development or bodily decay, it is always, though proceeding from whatever cause, exalted or modified thereby.

The teeth and their environments, indebted as they are to the fifth pair of nerves (trifacial, trigeminus) for their connection with the centers of innervation, must necessarily, in an abnormal condition, exert an influence throughout the ramifications of this nerve, to whatever locality or tissue its filaments are distributed. The recognition of the various diseased conditions to which these organs are liable is of no little importance in discussing what is termed facial neuralgia.

Were it, therefore, possible to enumerate and classify concisely these deviations from health in the order in which they become disturbing elements, it would be an important preliminary step. But such an arrangement is impracticable, owing to the fact that while they are frequently exciting causes of neuralgia, yet it is possible for various diseased conditions to exist where there is no predisposing cachexia, without more than the expression of merely local discomfort. At other times trifling lesions, co-existing with unfavorable constitutional conditions, will produce distressing results. I will attempt, therefore, to indicate only some of the numerous abnormal conditions, allowing each of you to give them such significance as your experience may suggest.

The branches of this trifacial nerve from which we are liable to have expressions of pain, and the points to which they are distributed, are as follows:

From the ophthalmic division we have a branch from the supra-orbital notch (the supra-orbital) distributed to the frontal surface; a branch to the upper eyelid (the palpebral); a branch to the globe of the eye (the ocular); and a branch to the inner angle of the orbit (the trochlear). From the superior maxillary division we have branches

issuing from the infra-orbital canal, distributed to the superior anterior teeth and cheek (the infra-orbital); a branch to the malar bone (the malar); and branches to the upper lip and palate (the superior labial and palatine). From the inferior maxillary division, a branch to a point in front of the ear (the auriculo-temporal branch); branches from the mental foramen to the lower teeth and gums (the anterior inferior dental); and branches distributed to the tongue and under lip (the lingual and inferior labial).

Neuralgia may attack any one of these three divisions of the nerve, but seldom more than one at the same time. The most frequent occurrence is the limitation of pain to the ophthalmic division.

It will be well, in order that we may better understand our subject, to first glance at the anatomy of the tooth, its surroundings, and its sources of nutrition. When examined by the unaided eye the tooth-structure presents a comparatively homogeneous mass; but, viewed with a lens of moderate magnifying power, we have unfolded three structures of varying density, vascularity, and recuperative power.

The enamel covering the crown and affording comparative protection from attrition, as well as from the external destructive chemical agents with which it is at times surrounded, is the most dense and least vascular of all the tissues. The dentine, of which the larger portion of the tooth is composed, is permeated by tubuli opening into the pulp-chamber. This has less density and a greater degree of vascularity, and is capable of manifesting an exalted condition of sensibility. The cementum forming the external surface of the root is of varying thickness, is less dense than the dentine, and of much greater vascularity. It receives its nourishment from the membrane (periodontum) covering the surface, and from which vessels pass into numerous cells, or lacunæ, distributed throughout its substance. From these lacunæ tubuli diverge and add to the vascularity of the structure, by virtue of which it is susceptible of both hypertrophy and atrophy.

The pulp of the tooth, composed of the nerve, vein, artery, and remains of the formative tissues, occupies the cavity in the center of the dentine, and is its principal source of nourishment, throwing up branches into the cusps of recently-developed teeth, and holding its connection with the arterial and nervous system through the foramen at the apex. Confined as this pulp is, in a fully-developed tooth, in an unyielding cavity, it is not strange that when it is the seat of inflammation, or even of a limited degree of vascular excitement, it should produce considerable disturbance in the nervous region with which it is connected.

The periodontum covering the surface of the root and lining the alveolar socket, supplying them with nutrition, is, like the dental pulp, confined between two unyielding surfaces, and when congested is the

seat of pain which is not infrequently reflected to the foci of other branches of the fifth pair of nerves.

The death of the dental pulp, unattended by caries or other disturbance of the tooth-structure, is a result frequently accompanied by much suffering, of a character so general that it is difficult of prognosis.

That it is often the cause of pain throughout the region to which the trifacial nerve is distributed is patent to every observing practitioner. Not only is this true of the pulp in its inflammatory stage, but if it should become devitalized and the inflammation subside without the establishment of a fistulous opening from the apex of the root, it continues to be at intervals a source of disturbance to this nerve and its terminal branches. The extent to which it is a cause of discomfort depends largely upon systemic conditions. Could these conditions be corrected by timely and appropriate remedies, the tooth might be kept permanently quiet and comfortable.

A lesion of nutrition, or any depraved constitutional condition, is, not infrequently, the only cause to which the loss of vitality in a pulp can be attributed; but whether from this cause, or from loss of tooth-structure by caries or external violence, the results are not materially different where there is no external opening to the pulp.

Denudation, or wearing away of the tooth by mastication, caries, superficial or deep, or fracture, may each produce a condition of pulp which, though but little local pain is experienced, will yet be an exciting cause to facial neuralgia.

Chronic inflammation of an exposed pulp, resulting in a vascular growth filling up the cavity of decay, and so remaining for months without local distress, will at times prove a prolific source of reflex irritation in the ramifications of the fifth nerve.

In a carious tooth properly filled with gold, the metal, acting as a conductor, transmits thermal changes to the sensitive pulp beneath, and vascular excitement is the result. In a normal systemic condition we should have from this hyperæmia, consolidated tubuli, and thickened walls with a protected pulp; but in an anæmic patient, or one with depraved nutrition, this recuperative effort is not so successful; hence we are likely to have a congestion of the pulp, which upon slight provocation produces paroxysms of extreme pain throughout the nervous region. Should the pulp become devitalized by reason of this congestion, and no external opportunity of exit be allowed for the products of decomposition, severe periodontitis is apt to be provoked, and the contact of distended vessels with living nerve-filaments around the apex may produce intense neuralgic pain which may be radiated throughout the trifacial tract.

The dentinal pulp, or formative tissue of the dentine, calcifies from the periphery toward the center, and continues this process until an

arrest of growth takes place by the complete formation of the tooth. How long a time elapses after the completion of this physiological process and the beginning of that which we recognize as a recuperative effort, in the filling up of the tubuli and calcification of the pulp, it is not easy to determine. Any one performing operations repeatedly upon the teeth of the same individual readily detects an increased density in their structure from year to year, and also a recession of the cornu of the pulp from the cusps.

These changes progressing, as they do, gradually and painlessly, are doubtless normal; in fact, are but a continuation of the original formative process, and the only recuperative effort the tooth can make to protect itself from the inroads of caries, or the abrasion consequent upon mastication. They are not infrequently continued until the large pulp-chamber is obliterated, and the root for half its length completely solidified. Occasionally, however, the calcifying process seems to be from some cause diverted, and the phosphates and carbonates which were intended to thicken the walls between the pulp and its external irritants are deposited in little masses throughout the body of the pulp. These are found varying in size from almost imperceptible granules to those the size of a hemp-seed, and not less dissimilar in shape than in size. The cause of this perversion of calcification is yet unexplained. Were this condition found only in teeth in which irritability had been induced by caries, it might be anticipated; but these nodules have been found not infrequently in teeth faultless in structure, and their presence is most difficult of diagnosis in either case, though the neuralgic suffering at times induced is almost unendurable.

Any of the permanent teeth when impacted in the jaw and there retained for want of room are liable to occasion neuralgic pain; but none of them so frequently produce serious disturbance as does the third molar, when crowded between the ramus or tuberosity of the jaw and the roots of the second molar. The roots of this tooth, when in this position, are apt to be undeveloped at their apices. "The augmented vascular and nervous action resulting from the irritation caused by the ineffectual efforts at eruption are doubtless sufficient to cause the protrusion of the pulp-mass from the incomplete aperture of the root, which, pressing against the sharp edges of the foramen, gives rise to severe neuralgic pain, which may be localized, or radiated, or both."

A persistence in position of deciduous teeth whereby their permanent successors are impeded in eruption is not of infrequent occurrence, and while this condition is not apt to be attended with severe local disturbance, it is a prolific source of neuralgia, with the cause so obscured that it is difficult of diagnosis, except with a correct knowledge of the time of eruption of the permanent teeth.

The pain experienced is more frequently confined to the line of the maxilla extending anteriorly from the tuberosity or ramus, is rather intermittent than constant, and is principally due to causes like those alluded to in the impaction of the third molar. The surrounding gum becomes thickened and reddened, but with only slightly exalted sensibility, and speedily regains a healthy condition upon the removal of the persistent tooth.

The accumulation of salivary calculus upon the necks of the teeth, though of very frequent occurrence, rarely produces neuralgia, except when there exists a predisposing systemic condition. Under such circumstances it causes suffering by inflaming the periodontum, with which it comes in contact as it encroaches upon the root of the tooth. Its disturbing influence varies greatly with its density and quantity.

Exostosis of the fang, chronic periodontitis, dead roots perforating the floor of the maxillary sinus or imbedded in the gum, and persistence of the gum over a developing tooth,—each and either of these conditions may, when associated with some systemic morbid condition, produce painful derangement of the trifacial nerve.

Imperfect protection of the feet in wet and cold weather, want of sufficient out-door exercise, deficiency of refreshing sleep at proper hours, malnutrition, or depraved condition of the system from any cause, predispose the trifacial nerve to functional inharmony, and the teeth containing the terminal filaments of some of the branches of this nerve are the first to feel and respond to these morbid influences. Being once disturbed, they reflect their discomfort upon the nerve-trunk, thereby producing an irritable condition that not infrequently extends beyond the domain of the trifacial nerve. *The important fact must be recognized, that the normal exercise of every function is restricted within certain definite limits of temperature and nutrition.*

Now, my friends, these few thoughts have but little value save for the lesson they teach in behalf of a broad and thorough education. We see how intimately abnormal conditions of the teeth are associated with systemic derangements, and how impossible it is to treat local lesions wisely or successfully without an accurate appreciation of constitutional relations. Education, to be advantageously appropriated, must be developed from the general to the special; and, to reap the benefit that should be derived from the concentration of energies upon a particular line of study, a solid general education must form the basis or foundation. However essential may be the studies of dental histology, dental physiology, dental pathology, and dental therapeutics, unless a thorough knowledge of *general* histology, physiology, pathology, and therapeutics has been previously gained, embarrassment and mortification must meet us at every turn.

NECROSIS AND CARIES.—FORMATION OF PUS.—INFLAMMATION DEFINED.

BY WM. H. ATKINSON, M.D., D.D.S., NEW YORK.

(Read before the New York Odontological Society, December 21st, 1875.)

Necrosis and Caries.

A THOROUGH review of the great number of interesting cases presented to us at the last February meeting of this body would require the best effort of our powers during the entire time allotted to this session. Therefore I refrain from noticing more than one; which one, however, has seemed to me of sufficient importance to deserve a somewhat extended analysis.

A case was presented of *necrosed maxilla and antrum*. In this case a surgeon expressed the opinion that the operation was "admirably performed, but too late." This opinion suggests the question, *Is necrosis progressive?* The answer to which may be found in a close study of the concomitant and differential history of necrosis and caries.

In order to the complete appreciation of my ideas on this subject, it will be necessary to give a short description of the mode of production and maintenance of tissues.

The phases of this production and maintenance consist in the aspects of degrees of satisfaction of elemental affinities, displayed under mechanical, chemical, dynamical, and psychical law, in the domination of increment and decrement of matter and force. The history of every body is but an account of the transmissions and transpositions of these two elements,—mass and energy.

Thirteen kinds of atoms enter into the constitution of the human body. In the play of the affinities possible to these we have the measure of all the changes that can ever occur in the tissues and organs.

A complete inter-satisfaction of the affinities resident in the atomic elements of the body constitutes *protoplasm*, variously known as *pabulum*, *juices of the flesh*, mucous mass, neural mass, etc. The perfection of this product of atomic combination is the prerequisite to healthy play of function.

The harmonious association of atoms produces healthy protoplasm; their inharmonious association produces the reverse. That is to say, each change of place of pabulum involves the mechanical, chemical, and dynamical concomitant changes, the due equation of which constitutes health, and the deficiency of either, disease.

The production of currents of air, food, and blood depends upon apparatuses varied according to the necessities of each in respiration, digestion, and circulation; whence we derive organic, somatic, and psychic energies.

The lungs take in a large measure of air, of which the blood absorbs but a small proportion,—four or five per cent. The alimentary apparatus also takes in much more food than it appropriates to direct use. The circulatory apparatus must keep up an almost continuous flow, to transmute the respiratory gyre, the intestinal gyre, and the vascular gyre into the summation of all these to constitute the nutrient gyre, or appropriation of pabulum by the diastole and systole of the cell-territories.

The associative and dissociative currents flow in the lines of least resistance. Hence we call bodies through which a current passes freely conductive of that current; and bodies which resist a current, or transmit it with difficulty, are said to be obstructive of that current. The perfection of molecular constitution, therefore, depends upon the completeness of atomic permeability to the current that transforms these atoms into the resultant molecule; or, in other words, health depends upon the proper and free circulation (and appropriation) of pabulum in the various tissues of the body.

Now, we are ready to declare that *necrosis results from privation of pabulum*.

The simplest privation is mechanical closure of the channels of supply.

When the pressure is slight, and the arrest gradual, the necrosis takes the form of atrophy called "*dry necrosis*."

When the obstruction is sudden and complete, the territory cannot be drained of the fluids, and they rapidly pass through disintegrative metamorphosis, then presenting the characteristics of "*wet necrosis*."

Necroses in soft parts, away from bones, are variously named abscess, gangrene, slough, and mortification, as they vary in character and extent.

Let us observe a case of necrosis of the dense corium of a bone.

The density of bone depends upon the abundance of lime-salts in the Haversian systems, and the compactness of the bone-cells or bone-corpuscles. This density interferes with the free circulation of the pabulum.

The *lacunal* or intra-cellular, and the *canalicular* or inter-cellular, circulation, is extra-vascular in the sense of the red-blood circulation; hence true bone-circulation is a sort of *endosmosis* and *exosmosis* of pabulum,—colorless blood,—which depends for activity upon the energy of the currents from whence it is derived by transudation through capillary walls, that readily yield to the pressure of the blood-column in their arterial connections.

Any paralysis of the vaso-motor nerves which regulate the tone of the vascular system will be followed by enlargement of the capillaries, slowing and stoppage of the currents of blood in the small vessels, transudation to repletion of plasma—and, perhaps, blood-corpuscles

also—into the bone territories, and stoppage of normal endosmose and exosmose.

At this point, the stillness of the osmotic currents favors molecular change in the form of fermentative or putrescent actions, by which the necrotic point, or point of molecular death, is established, and thus we have the inception of extended necrosis.

When the retrograde metamorphosis of the pent-up pabulum arrives at the point of dissociation or solution, freeing the bonds of affinity of the atoms that compose the pabulum, some of the atoms will be set free in the form of gas. This gas distends the territories in which it forms, and, by mechanical pressure, interferes with the freedom of the osmotic circulation of the lacunal and canalicular neighborhood, and impedes the vascular circulation, by extension and repetition of the processes described, until the whole territory supplied by the paralyzed vaso-motor nerve is involved in the retrogressive change called necrosis.

It will be observed that the action takes place in the soft-solids and fluids that are deprived of normal freedom of nutrient movements. When this seat of the generation of gas is within the stratum of osteoplasts that lies between the periosteum and the corium, the distending force of the gas peels off the periosteum from the bone, with its vascular supply, thus destroying the circulation in the superficial layer of bone-cells beneath. In case the death of bone-corpuscles extends sideways only, spreading along the surface of the corium of the bone, the case is called an example of *caries*. But, if the subjacent stratum of bone-corpuscles be involved, it will now be called *necrosis*. This is the proper distinction between caries and necrosis.

Necrosis is the *generic* term; *caries* a *specific* term, denoting the superficial form of necrosis.

All forms of death of the structures of the body are examples of true necrosis. Hence the analogue of *ulcer* in the soft parts is *caries* in the hard; that of *abscess* in soft parts is *necrosis* in the bones.

In one word, wherever there is a *sequestrum* we have true necrosis of the books; while superficial *bone-sore* is a case of *caries*.

Formation of Pus.

Exudation may take place, and the exudate remain extravasated without going into the necrobiotic change requisite to produce gas. Here the distention of territory is insignificant; and many instances of this form of derangement return to health, through resorption of the exudate by the capillaries and lymphatics, with very slight impairment of biotics. *Maculæ* (marbled spots) and *petechia* (flea-bite) in the aged are familiar examples of such innocent exudation.

But in cases where interference with the proper digestion of food into pabulum has entailed a soured or pauperized blood-plasma, then the

exudate will pass into the necrobiotic or retrogressive change which produces gas, pus, sanies, ichor, and sphacelus, as the result of paralysis of the vaso-motor nerve.

That those of us who are more occupied in the practical division of our calling than in profound pathological investigations may appreciate the occult changes indicated by the terms here used, permit me to give some definitions which will never cease to be applicable.

We will examine the formation of pus.

When blood (both fluid and corpuscular) dies we have pus. That is, dead *liquor sanguinis* is liquid pus; and dead blood-cells are pus-cells.

Pus, therefore, is an aplastic fluid; that is, it is incapable of being converted into any higher form of combination of its atomic or molecular elements; therefore no tissue is formed from, or fed by, pus.

When simple fluid pus disintegrates, *sanies* (corrosive pus) is the result; and when the pus-cells disintegrate, they mix with sanies and form *ichor*. Then, when the connective tissue of the walls of the cavity containing ichor becomes in turn disintegrated by its malign presence, *sphacelus* presents itself.

And now the involved mass sloughs away from the territories not yet deprived of life, and the "line of demarkation" is set up between the living and dead territories.

It will now be apparent that the *killing presence* operates by degrees of retrogression of the bonds of tissual and molecular affinity,—the reverse of the progress of *combination*.

The "line of demarkation" is formed by the activity of adjoining territories, the vaso-motor nerves of which have not been paralyzed.

Whenever the sloughs are filled in by the unaided efforts of nature, scars (bands of cicatricial or scar-tissue) obstruct the functions of the part.

The lappings and blendings of capillary territories supplied by various branches of different vaso-motor nerve-trunks are usually determinative of the form of the margins of the slough and of the cavity it leaves in the part. Thus, capes or promontories of living tissue project into the chasm of slough, and islands of life, oases in this desert of death, present themselves as points from which may start the granulations destined to reproduce the flesh and restore, as nearly as circumstances will permit, the former contour.

Knowledge of these circumstances, and the ability to control them, are the necessary qualifications of him who would cope with them successfully.

Inflammation Defined.

The long-practiced habit of regarding groups of symptoms as the boor regards the clouds has much retarded the progress of medicine and surgery. Clouds are objects of sight only so far as they obscure

some portion of the light. Cloudiness and clearness of the atmosphere are not changes in either air or the vapor of water, as such, but only different tensions of their molecular arrangement; which fact, however, is rendered occult by the habit of regarding clouds as masses, and not examining into the minutæ of detail by which they are formed and dispersed without loss other than that of appearance.

Therefore, until we shall be able to resolve into their constituents or to look beyond the *clouds of heat, redness, swelling, and pain*, we shall remain under the shadow of the old definition of *inflammation*.

Inflammation, like every other process, is expressed in degrees of presence.

Nutrition is as legitimately "a burning" as its perversion which we denominate "the inflammatory process."

Nutrition—nourishment—consists in a harmonious concurrence of supply and departure, a coming and going of mass and energy.

The reception of affete, and the rejection of effete, organical constituents may be rhythmical and regular,—which is *health*. Or, the afflux may exceed the efflux,—when we have *hypertrophy*; or, the latter may exceed the former,—when we have *atrophy*; and these are the only doors of entrance for disturbance of tensional harmony in the currents of nutrition,—which is *disease*.

The degree of rapidity with which molecular changes succeed each other is the measure of health and disease.

Thus, when the change occurs so slowly as to fail to generate heat enough to preserve fluidity of protoplasm, stasis occurs, and disease may follow. When the activity of molecular change is sufficiently great to maintain a temperature of between 95° and 105° F., the protoplasm will be of the fluidity required to best meet the necessities of nutrient demand. When molecular metamorphosis is so rapid as to produce a temperature of from 105° to 110° F., the protoplasm becomes more or less disorganized and unfit for tissue-building.

Now we may safely diagnose "inflammation," evanescent or continued, as the case may be.

OPERATIVE DENTISTRY.

BY MARSHALL H. WEBB, D.D.S., LANCASTER, PENNSYLVANIA.

(Read before the Pennsylvania State Dental Society, July 15th, 1875.)

WHEN the necessary elements are furnished to the system in due proportion, and nothing interferes with the natural processes, the cells build up perfect tissues; the dental organs are properly formed and erupted, and, in due time, second dentition follows the first in strict conformity with established laws.

Nutriments is, however, not always rich and abundant; general or special function is not always normal; and the gastric, mucous, and salivary secretions not always in a proper state. Hence, other abnormal conditions are soon brought about; disintegration follows, and disastrous results ensue.

It is necessary that he who devotes himself to operative dentistry should comprehend all this, observe dentition throughout its different phases, and remove obstructions; avert, modify, or correct irregularity of the teeth, and prevent or arrest the progress of caries.

The practitioner should have a thorough understanding of the parts involved; because abnormal conditions often present which call for such qualification.

The deciduous teeth should be retained until displaced by the encroachment of the permanent ones, though it is sometimes necessary to remove disintegrated tissue and fill cavities of decay in them, that they may be preserved. The deciduous teeth should be extracted, however, when incipient or chronic abscess has taken place, thus averting an abnormal position of the permanent teeth. As they are dislodged and the permanent erupt, an examination should frequently be made to ascertain whether disintegration of enamel is going on upon the proximate surfaces or if caries has commenced in the sulci of the molars and bicusps. Often the enamel cusps do not coalesce, so that a deep sulcus or fissure is presented. During mastication, particles of food are impacted into these fissures; acid products are formed; disintegration ensues, and the opaque carious dentine can be observed through the translucent enamel, or the attenuated edges of this tissue may become fractured, and the cavity of decay thus be plainly visible; alimentary substances lodge, or become impacted, between the teeth; here, also, acid formations result; and disintegration of enamel ensues. This may be prevented, however, by polishing the proximate surfaces of the teeth frequently, and by having the patient pass floss silk or use the tooth-pick daily between them. This will not require more attention on the part of the operator and patient than if permanent separations were made.

When disintegration of enamel takes place upon a proximate surface, and the operator is positive that it is only superficial, such disintegrated tissue should be removed, and an evenly-polished surface carefully made. If the surface be left unpolished, disintegration may take place to an extent even greater than before. The removal of such tissue is often accomplished by means of a fine corundum disk, without previous separation by pressure; such separation should be made, however, to avoid the needless cutting away of surrounding enamel, both from the surface upon which the disintegration is found and from the proximate surface of the adjoining tooth. When such disintegration has

been removed, the rubber dam should be applied to the tooth operated upon, as well as to the one or more adjoining, so that the parts may be in a dry condition for a careful examination. If the whole surface presents the appearance of normal tissue, it should be thoroughly polished, first with strips cut from emery cloth of the finer grades, and, after the removal of the rubber dam, with pulverized pumice, applied upon a soft-rubber disk, or upon linen tape. If, however, there remains a portion of enamel having a chalky appearance, the operation of removing the disintegrated tissue has not been successful, and the disintegration may be found to extend even to the dentine, thus necessitating the cutting out of all such decay, and the careful and thorough filling of the cavity presented.

When disintegration has ensued in a sulcus, or the sulci, of a molar, or the fissure of a bicuspid, the rubber dam should be neatly applied, so that the parts be made dry and brought more plainly to view; after which the cavity should be opened into by means of enamel chisels, if caries has made considerable progress underneath the plate of enamel. This can be very quickly and nicely done by operating such instruments by the electro-magnetic mallet. The softer portions of carious dentine should then be removed by sharp excavators, and the fissures sufficiently opened and anchorage for the filling secured by keen burs. The walls should be well shaped, the margins evenly and smoothly finished; a starting-point made; and the cavity so prepared that all the gold may be impacted by the aid of the mallet.

If, in impacting gold, any part or the whole becomes displaced, it should at once be removed, otherwise the filling will be imperfect. The movement of the gold may not be observed, however, especially when pellets, cylinders, and similar forms of gold are used.

The gold should be so carefully prepared, introduced, and impacted, that one is positive that each piece is firmly anchored, or has adhered to that already introduced; and, being certain of this, the filling cannot but be solid and uniform in density. In the filling of cavities caused by caries in the sulci, the gold should be so impacted as to be flush with the margins, yet made concave and so as to correspond with the surrounding tooth-structure, although that part of the inclined portions of the cusps which is built out with gold need not converge so as to form an acute angle, as seen in nature. Here, and here only, with possibly a rare exception, should fillings be made with a concave surface.

When disintegration of enamel takes place upon the buccal surface of a molar or bicuspid, or the labial surface of the anterior teeth, and caries ensue so as to form a cavity, the operation of filling such a cavity is somewhat similar to that required where decay occurs in the sulci or fissures, with the exception, mainly, that moisture would interfere to a far greater extent.

Desirable results cannot be obtained in the first-mentioned class of cases (which are termed simple, and which certainly are, when indifferently treated) without the use of the rubber dam; neither can any but almost worthless operations be performed where decay attacks the buccal and labial surfaces, unless this most valuable of all dental adjuncts be properly applied. When caries extends beneath the margin of the gum, it is sometimes difficult to apply this, but then the ligature—the waxed floss silk—should be placed twice around the tooth which is to be operated upon, after it is secure upon the adjoining teeth, and, while holding the ends of the ligature in the left hand, both it and the rubber dam should be pressed above the margin of the cavity, so as to bring it into view. A clamp should be used when applying the rubber dam to the lower molars.

It is often necessary to hold the ligature, together with the rubber dam, by means of a broad-pointed excavator, above the margin of a cavity which occurs upon the labial portion of an anterior tooth. Before commencing such an operation it is best to have everything at hand which may be required.

After the removal of carious dentine by sharp excavators, the margin of the cavity should be evenly and smoothly finished, and all the disintegrated enamel be removed by means of a fine, yet keen-edged, plug-finishing bur, operated by a dental engine. A slight undercut should be made all around the cavity, about the part where the enamel and dentine coalesce, and a retaining-point made in a direction where there will be no liability of approaching pulp-tissue, to serve as a starting-point.

When disintegration takes place upon the approximating surfaces of the teeth, and the dentine is involved, it is necessary to remove the disintegrated tissue and fill the cavity presented. This is a more difficult operation than those just described, and but comparatively few operators perform it well. Many take gold- or tin-foil and roll it into a shapeless mass and bring it in contact with their fingers, or mix up amalgam, and then place one of these materials in the sulci of molars or bicuspid, in an indifferent manner, in cavities only partially or imperfectly prepared, and the proximate surfaces also involved. In due time carious action so advances as to involve the dentine immediately overlying pulp-tissue and cause odontalgia. The patient is then informed that the tooth must be extracted before relief can be afforded; and thus, in a comparatively short time, the malpractitioner brings about an edentulous condition, thus making it necessary to insert an artificial denture.

Permanent separation is sometimes made for the purpose of getting at the part of the proximate surface affected, and thus a portion of good tooth-structure is needlessly sacrificed, and even portions of den-

tine may be exposed. Food passes along the inclined surface to the neck of the tooth, and is there impacted between it and the one with which it comes in contact, and acid products are formed; or, if the substances impinge upon the gum, and this induces the patient to remove them, the particles of food finding lodgment upon the unpolished surfaces will also cause such a result. If the tooth-structure does not speedily undergo a change and become more dense, or if the patient is not very careful to keep the parts not only well cleansed, but also to gradually polish the surfaces, disintegration will ensue to a greater extent than before.

When separations are carefully made, and the proximate surfaces so shaped that food will not so easily become impacted at the necks of the teeth, and the whole operation of removing the disintegrated tissue, forming the cavity, inserting the filling, and polishing the surfaces, is thoroughly performed, caries will rarely recur. Even when thus performed, these operations are not the most desirable.

Permanent separations enable an operator to fill cavities occurring in proximate surfaces much more easily and quickly, and his fee per hour may thus be more; but, notwithstanding all this, one should always make every endeavor to perform first-class operations and to preserve the natural type of the teeth.

When the enamel of the proximate surfaces of the molars and bicuspsids is penetrated, and the dentine is involved in the carious process, and separation by pressure has been made by means of wood or cotton, and the rubber dam applied, the cavity of decay should be opened into from the masticating surface, excepting in rare cases when an opening through the buccal wall of enamel may appear necessary to gain access to a cavity near the neck of the tooth. Even where but little structure appears to be involved, the masticating surface would be almost reached upon the perfect removal of the disintegration, and thus the plate of enamel would be liable to fracture were hard substances to come in contact with it whilst food was undergoing comminution. It is far better to cut away this portion of enamel than to sacrifice structure along the entire proximate surface; besides, a better view can be obtained, and thus a more perfect removal of disintegrated tissue will be facilitated, and the gold can be more thoroughly impacted. Hence, the operation can be more perfectly performed in this way than in any other manner. In addition to this, the adjoining sulcus or fissure is usually in a condition requiring attention, and should also be prepared and the operations completed at the same time. The cavity should be so prepared that no disintegrated enamel remains, the edges uniformly and smoothly finished by means of fine plug-finishing burs and emery-cloth, and a groove cut around the cavity near where the dentine and enamel coalesce. This groove should be

quite well marked along the buccal and palatal or lingual walls. If all disintegrated enamel be not cut away and proper anchorage made, the operation will prove a failure, even if the operator be capable of inserting gold solidly and finishing it exquisitely; and it would be wrong, as well as altogether unnecessary, to attribute the cause of such failure to the gold, as an "excitant of chemical action."

When a cavity is prepared as just described, a starting-point should be made in that portion of the cavity which extends near the neck of the tooth; not, however, in a direction where the pulp may, in any manner, be injured, but longitudinally, and about where the dentine forms a coalescence with the other hard tissue of the part,—the enamel, or cementum. This point should not be deep, but just sufficiently so to retain the small pieces of gold first introduced and impacted, until other pieces are built upon them.

The gold should not only be built against every part of the dentinal structure, but should be impacted as perfectly as possible against the margins of enamel; and to accomplish this it is necessary to build the gold against the proximate surface of the adjoining tooth; but if there be a similar cavity in such tooth, or if too great a space intervenes, it may, sometimes, be well to adjust a matrix, made of a smoothly-worn separating-file.

After the gold has been impacted, piece by piece, so that the substitution for lost tissue is complete, a fine separating-file should be used to cut away the surplus material, and to aid in making the filling conform to the original contour of the tooth, after which strips cut from fine emery-cloth should be so manipulated as to more perfectly finish the surface of the gold, and to leave the parts smoothly and gracefully formed. All this must be done before the rubber dam is removed, after which the finishing should be completed by the use of finely-pulverized pumice and silex, mounted on linen tape. If the application of fine rouge to parts about the mouth be not considered objectionable, or if it be used with the pumice previous to the removal of the rubber dam, a small portion may be applied upon a strip of fine chamois-skin. A finer finish, although not so bright a polish as when a burnisher is used, is thus produced. The finishing of the gold upon the masticating surface should be done with corundum cones and Hindostan stones, followed by pumice or silex, mounted upon wood or leather points, all operated by a dental engine. The burnisher may also be used if a brighter luster is desired.

Whether a cavity be large or small, the gold should be built out beyond the margin of enamel, so that the filling may be trimmed off in conformity with the contour-line of the tooth,—*contour signifying the line that bounds, defines, or terminates a figure*. This being true, it is then certain that all fillings should be contour, at least so far

as that portion of the gold which is built against the margin of enamel is concerned. If the gold be not impacted against, and be not flush with the edges of enamel, the operation will not be such as is demanded for the preservation of the remaining tooth-structure. Even when so impacted and the fillings are finished so that only a plane surface of gold remains, the tooth thus operated upon will most likely come in contact with the one adjoining, and this plane surface allow the enamel of the one to approximate too closely that of the other. This should be obviated by restoring the contour,—making the line of the gold conform to the original contour of the lost tissue,—and then, when a tooth so operated upon approximates the next in the arch, the most prominent part of that which is restored in gold will come in contact with it, and thus leave the margins of enamel free.

Disintegration commences upon the approximating surfaces of the teeth, almost invariably at or about the points of contact, and when the dentine is reached, caries takes place beneath the plate of enamel in all directions.

Even if the decay has advanced to the neck of the tooth, or the carious process been still more extensive and resulted in fracture of the enamel, the original contour should be so restored that when the teeth approximate the gold in the one shall come in contact with the normal tissue in the tooth adjoining, or with a filling, if one has been inserted. Attenuated walls of enamel should be cut down until evenly-polished and firm margins are made, so that, in the restoration of contour, the gold may be built over the prepared edges of such walls, thus protecting them.

Such fillings, when carefully and skillfully inserted and finely finished, not only protect the enamel over which the gold is built, but prevent the wedging of food against, and the consequent recession of, the gum; subserve well the purpose of mastication, and present a beautiful appearance.

While such operations come nearest to perfection, and are the most desirable, they are difficult; and that they may be successfully performed requires that the operator have a proper understanding of what they should be, and the ability to carry into execution the design as furnished by nature.

When fillings are inserted and finished as here indicated, they are not only the best so far as utility and beauty are concerned, but are also best for the preservation of the remaining tooth-structure.

When a permanent separation is made, a considerable surface of tooth-structure is exposed, and this affords lodgment for particles of food upon the proximate surface to a greater extent than before, and even if that surface be polished never so thoroughly, it cannot be made as perfect as it was originally.

While the buccal and labial and the palatal and lingual surfaces are quite thoroughly washed by the oral fluids, such proximate surfaces, being out of the course of the direct current of saliva, are but imperfectly kept free from particles of food and from *leptothrix*.

When the gold has been properly built out and finished, so that the contour-line of the tooth is perfectly restored, the margins of enamel against which the gold is impacted do not come in contact with the adjoining tooth at any point, but the gold approximates instead, and this not being acted upon by agents which bring about decay, the parts are kept quite free from disintegration. The remaining structure is cleansed by the saliva, which is kept in almost constant motion by the action of the tongue, lips, and cheeks.

When disintegration takes place upon the proximate surfaces of the anterior teeth, they should be separated by the wedging of wood or cotton between them. After sufficient space has thus been gained, Hill's stopping should be impacted between the teeth, and allowed to remain a short time, until the irritation caused by the wedging has passed away. Under no circumstances should rubber be made use of for the purpose of thus separating teeth, because of the irritation, and sometimes inflammation, which it induces. Quick-wedging is occasionally resorted to, and at times may be necessary. When the required space has been gained, if the parts are uninflamed, the rubber dam should be applied and the operation commenced. Here, as elsewhere, the cavity should be carefully prepared, and the edges of enamel uniformly and smoothly finished, as before indicated, and the operation so completed that there shall be a perfect restoration of contour.

Operations should always be performed as perfectly and artistically as possible, so that, if gold is exposed, it shall not be repulsive to the eye. The gold should be so impacted against the dentine and enamel that when the operation is completed and these surrounding tissues made clear and bright again, the gold tint may be observed through the light walls of the translucent enamel, thus evincing that the filling was quite perfectly inserted.

The writer recently operated upon teeth which contained fillings inserted twenty-five years ago, by Dr. Thos. W. Evans, of Paris, then practicing in Lancaster, Pa. Never did fillings serve the purpose intended better than they. The gold was so impacted against the dentine and enamel as to keep these surrounding tissues clear and bright, but in consequence of this the gold tint was, even after the lapse of a quarter of a century, plainly discernible through the enamel. These operations were still further unmistakable evidence that it is not a peculiar preparation of gold, not the appliances nor *experience*, upon which the performance of successful operations depends, but upon intelligence, ability, genius, and the motive which actuates the man.

While these fillings would always have remained as evidences of Dr. Evans's skill, had the gold been built out, so as to make it even with the edges of enamel, and to fully substitute for the lost tissue so that the line which defined the original contour would have been perfectly restored and the gold in the one have come in contact with that of the other, instead of allowing the enamel to closely approximate, these operations would have been still finer mementos.

These fillings were removed and others inserted, simply because they had not been made fully even with the edges of enamel, and because they were, also, concave; and, although quite nicely finished, for a number of years the surface of the gold has been dark, and, for reasons stated, could not be kept bright, notwithstanding the lady made every endeavor to do so when daily cleansing the incisors upon which the operations had been performed.

When small cavities are to be filled, about a half-leaf of light foil should be taken from the book by means of the foil-carriers and placed upon a piece of spunk which has been covered with lamb-skin. This should then be folded with an ivory spatula into a tape-like form, of about three lines in width, then taken in the foil-carriers and cut into parts from one to three lines wide. These parts, as they are cut, should fall upon spunk, covered as just stated, from which they can be readily taken up with the plugging-instrument. When thus covered by lamb-skin, there is no liability of occasionally introducing spores from the spunk in connection with the gold.

Where large fillings are to be inserted, a whole leaf should be folded and cut in the manner described, or even more may be thus prepared.

Heavy foils can be used advantageously, especially when restoration of contour to a considerable extent is required, although light foil—prepared as described, and kept from contact with the fingers or with moisture—is more easily impacted into the irregularities, under cuts, and all parts where it is necessary to do this by pressure. When these parts are filled, and anything approximating direct force can be applied, a suitable plugging-instrument, having finely-serrated points, should be selected, placed in position in the electro-magnetic mallet, and, by the aid of this instrument, the gold can be rapidly and perfectly impacted. Each piece should be taken upon the point of the plugging-instrument (unless an assistant is present to use the foil-carriers) and passed through the flame of alcohol, although it should not be subjected to more heat than to bring about a rose-tint,—this passage through the flame causing the gold to cohere more quickly and perfectly. A certain degree of cohesiveness is necessary, that one may accomplish all that which is desirable, although that degree should not be such that the gold works harshly.

Non-cohesive gold can be used in the stopping up of cavities which

are treated as mere single holes, but, in the performance of first-class operations, it is necessary to make use of a foil the particles of which will *cohere*.

When impacting gold by the aid of the electro-magnetic mallet, the degree of cohesiveness should be greater than when only hand-pressure is exerted, because, being more rapidly and perfectly impacted by the aid of this instrument, it is necessary that the gold cohere more quickly. The gold should, also, be of uniform density throughout its entire mass.

With no other instrument can all these results be attained to such a degree of perfection as with the electro-magnetic mallet.

A very great deal could be said in reference to the excellence and efficiency of the appliances which aid in the performance of operations, and especially regarding the rubber dam, which appliance is the most valuable, although it appears to be the most simple, of all. It would seem that the dental engine should be regarded as next in value; but those who understand, and have successfully operated, the electro-magnetic mallet, place it second only to the rubber dam.

Dr. S. C. Barnum will be gratefully remembered for inventing and donating the latter; due credit should be given those who have used their talents for the invention and perfection of dental engines and other appliances, and the name of Dr. W. G. A. Bonwill will ever be associated with the electro-magnetic mallet, as is that of Morse with the electric telegraph.

When an operator has not the ability to perform, or the patient cannot afford, first-class operations, then it may appear necessary to insert tin-foil, cement plombe, a preparation of gutta-percha, or, as a last resort, and in preference to extraction, amalgam; but outside the question of galvanic or non-galvanic action, and the shrinkage or non-shrinkage of amalgam, it is, especially after it has been inserted for a time, repulsive to the sight.

Caries often so involves dentinal structure that a part of the pulp-tissue becomes almost or quite exposed, and odontalgia ensues. In such cases the cavity of decay should be opened into, foreign particles dislodged by the injection of tepid water, and the soft carious dentine be removed, when the pain will be modified or arrested. If it should still continue, a sedative application, such as chloroform upon lint, should be employed, after which, when the parts are made dry, carbolic acid should be applied. A cap of note-paper should be placed over the exposed, or nearly-exposed, point, so that while the temporary filling of Hill's stopping is being inserted, it be not encroached upon. All this should be done very carefully. If, after a brief interval, there be no further pain, the operation may be completed.

After the rubber dam has been applied, light should be reflected to the part by a mouth-mirror; and all the disintegration should be

removed except the discolored dentine which covers the pulp,—such a protection being very much better than an artificial one. When all save this has been removed, warm air should be used to drive off the moisture yet contained in such discolored dentine, when it should be saturated with carbolic acid or pure wood creasote, again made dry, and Hill's stopping carefully applied.

If the exposure be such that the requisite pressure cannot be made, a portion of the stopping, of a ribbon-like thickness, should be softened in chloroform, and this, or a small light piece of fine paper coated with carbolic acid, very carefully placed over the exposed point, and then oxychloride of zinc applied. This should be allowed to remain for some time before the permanent filling is inserted, although, under favorable circumstances, the operation may be proceeded with very soon after such material has become hard.

When, because of continued irritation, inflammation of pulp-tissue results, the application of a particle of an arsenical preparation may be necessary to speedily devitalize it. After this is done, such devitalized tissue should be carefully and thoroughly removed, and, after the slight hemorrhage sometimes following such removal has ceased, the parts should be properly cleansed, and the pulp-chamber and cavity of decay filled at once with gold,—this being very carefully introduced and impacted. The apical foramen should be thoroughly closed, so that infiltration cannot take place.

Whenever the pulp-chamber is sufficiently large to admit an instrument, gold can be inserted; and if it be not so, it may be drilled into and enlarged. If, however, the pulp-chamber cannot be reached, the part should be disinfected as much as possible by the forcing of carbolic or salicylic acid into such chamber; and then, if the tooth be a molar, and the other root or roots filled, the bulbous portion of the chamber, and in some cases a part of the cavity of decay, should be filled with cement plombe, which, while yet in a plastic condition, should be forced as far into the root and be made to as completely fill the other parts as possible. The oxychlorides seem to absorb the mephitic gas arising from particles of putrescent pulp-tissue, or to prevent such putrescence; hence the application as described.

When the cement becomes hard, sufficient of it should be cut away and the cavity so prepared that proper anchorage may be secured and the permanent filling inserted.

When devitalization of the pulp has taken place and the tissue is decomposed, such putrescent matter should be carefully and thoroughly removed, the parts cleansed and disinfected, and the pulp-chamber and cavity of decay temporarily filled. Should a particle of this matter be allowed to remain, or have been forced through the apical foramen, irritation of the tissue surrounding the apex of the root may follow.

The patient should be instructed to return at once upon the occurrence of such symptoms, when the temporary filling should be removed, a short time should be allowed for the escape of the gases arising from the decomposed matter, and the parts again cleansed and closed. This should be repeated at intervals until it is found that congestion no longer follows, and that normal action has been re-established in and about the pericementum, when a permanent filling may be inserted.

If, in the treatment of such cases, incipient abscess is discovered, and the disorganized or pus corpuscles do not escape through the apical foramen upon the removal of the temporary filling, an opening should be made so that this may be brought about. This opening should be so small, however, that one may avoid forcing gold through it, yet large enough to facilitate the escape of the purulent liquid. If this cannot be done, the operation of drilling through the alveolar process to the end of the root, as suggested by Dr. Garretson, may be performed, and relief thus afforded. Should the escape of the pus-corpuscles not be effected after all this, an abscess will very probably be formed.

Even should abscess follow, and the pain before the pus is discharged through the alveolar process be severe (unless the patient is kept during this time partially under the influence of morphia), yet, when this has occurred, and normal action of the parts is again established, the root or roots thoroughly cleansed, and these, in connection with the bulbous portion of the pulp-chamber and the cavity of decay, properly and permanently filled, no such manifestation should again occur.

So long as putrescent pulp-tissue is allowed to remain, and the mephitic gas arising therefrom escapes through the apical foramen, abscess will periodically take place, although, after a fistulous opening has been made, by which the pus was discharged when the abscess first developed, the engorgement, opening, and collapse of the sac in which pus accumulates is thereafter attended with but little pain or discomfort. This chronic abscess should be cured, however, so that death of the pericementum and periosteum may not take place and necrosis follow.

In the treatment of such abscess, it is not often necessary to do other than remove the putrescent pulp-tissue, force an escharotic, such as carbolic acid, through the apical foramen and into the sac (so as to break it up and change the surface from a pus-secreting to a normal one), and also through the fistule leading from such sac; after which, if the parts are kept cleansed, nature will effect a cure, provided there be no interference and nutrition be such that normal function may take place.

PROCEEDINGS OF DENTAL SOCIETIES.

AMERICAN DENTAL ASSOCIATION.

THE next meeting of the American Dental Association will be held in Philadelphia, Tuesday, August 1st, 1876. It is the desire of the officers and members of the association that the State and local dental societies, and the dental colleges of the Union, north, south, east, and west, should be fully represented at this meeting in the Centennial year of our national existence. The occasion is one not only calculated to bring about that united brotherhood which we desire as fellow-countrymen, but in addition, as professional men. The representative character of the organization makes it the most powerful and effective means for the elevation of our profession in advancing the cause of education. Speaking not for any particular section or any single interest, but for the profession at large, its recommendations assume a force that no local organization can possibly command. At the time of its inception, in 1859, there were present at the meeting at Niagara representations from ten local organizations. In the brief period of sixteen years that has elapsed since that, the number of State and local societies that have been formed has increased seven-fold. There are, however, several States in which dental societies have not yet been established; it is to be hoped that the profession in these States will at once move in the matter and organize State and local societies and send delegates to the meeting. The representative basis of the association demands that none other than those who come with credentials as delegates from local societies can be received as members. This, however, does not debar any respectable practitioner, as it is only necessary to unite with a local organization to be sent as a delegate.

The Centennial Exposition is calculated to attract, among others from abroad, a number of our professional brethren, and it is to be hoped that they will make arrangements to visit this country at the time of the meeting of the American Dental Association. If they should do so in sufficient numbers and participate in the deliberations on that occasion, the association would assume the character of an International Congress of the profession, a consummation most earnestly to be desired. Invitations have been extended to the profession in foreign countries to unite with us on that occasion. While we should be most happy to receive delegates from foreign dental societies, respectable foreign practitioners who may present themselves, without the credentials of a dental society, would be gladly welcomed, and an exception of the organic law would be made in their favor.

J. H. McQUILLEN, *Corresponding Secretary.*

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED BY L. ASHLEY FAUGHT.

THE regular meeting of the society was held Wednesday evening, October 6th, 1875, at the Philadelphia Dental College. The president, Dr. Louis Jack, in the chair.

Dr. Jas. E. Garretson presented "Chloride of Zinc" as the subject for the evening. He regarded it one of the most abused of good things. If we are to judge by the manner in which many men speak of it, nothing more is desired than that it should be plastered into teeth in order to obtain from it a result more or less miraculous. That the agent is an irritant does not appear to be taken into account at all, the idea being that in its virtues are found the salvation of exposed pulps and the resolution of all dental inflammations. A judicious use of chloride of zinc is to be founded on due conceptions of the character of the salt, and an appreciation of the circumstances under which it should be employed. In the form of oxychloride it is extensively employed for capping exposed pulps, and a common idea prevails that there is something specific in the material which fits it peculiarly for that purpose; in other words, it is a specific in its use, as quinine is specific in its way. Now, this is impossible, as one agent is of local signification, while the other finds its meaning through systemic relations. While he did not deny the fitness of oxychloride of zinc for capping exposed pulps, he thought the most important item in the consideration was the susceptibility of the dental pulp to the action of irritants. To flow over an exposed pulp a layer of oxychloride of such a fluid consistency as some operators recommend, is to do nothing but deluge the organ with muriatic acid. To have good results from such practice can hardly be expected unless muriatic acid is a non-irritant, which it most certainly is not. We all know that in the application of chloride of zinc there is pain. Wherever pain is present there is also a physical irritant, and where irritation exists we have one of the expressions of inflammation. These conditions are due to a twofold reason. 1st. The contact of a foreign material which risks the production of a slough; 2d. The continuous presence of this foreign body. To obviate these we should place a thin piece of quill, oiled silk, or gutta-percha between the agent and the exposure. If he had no break in the thin layer of dentine over the pulp, he would not have an excess of the chloride in the oxychloride of zinc capping, unless there is in truth a specific effect residing in the application he had made. While he thought the finer practice was to interpose the intermediate substance, yet he considered that just here the preliminary and best practice comes in,—viz., to precede the local by constitutional treatment. If he could draw away from the pulp the same amount of blood that was brought

there by the applied irritant, he was doing the best practice. This could be done in a variety of ways. If he could keep the patient's feet in a warm foot-bath long enough before the operation, it could be accomplished in this way. This being impracticable, we must reduce the action of the heart. Put the patient on bromide of potassium, combined with such a circulatory depressant as is found in *veratrum viride*; not on opium, nor morphia, nor any form of opium. He claimed that we cannot reduce a pulse from seventy-five to fifty beats without at the same time bringing down an over-circulation that may exist in a dental pulp.

Prof. Flagg. Capping exposed pulps with oxychloride of zinc, in his experience, is not good practice. He thought that it was obsolete with the advanced men of the profession. Most of the successes are for a period of but three weeks, while *three years* are not sufficient to determine this point. This is a short time for the trial, as our object is to keep the pulp in a normal condition, from which it must not deviate more than to deposit secondary dentine. It is in accordance with advanced practice to strike at the cause of the trouble arising from contact with chloride of zinc, and not to put it in contact with the pulp. He would not think of making an application of chloride of zinc to a pulp to preserve its vitality any more than he would of arsenic. He disagreed with Prof. Garretson in regard to constitutional treatment except in nervous patients. Thought that the bromide of potassium was a peculiarly treacherous thing. Thinks that for one dose or for ten it is admirable. Likes *assafetida* in this connection; would also suggest, as a counter-irritant, scarification of the free festoons of the gums. An application of iodine is also good—say, composed of three drachms to the ounce of alcohol, and applied after drying the gum. Counter-irritation in contradistinction to derivation is the rule. Come as near as possible for counter-irritation. Chloride of zinc is an excellent application to sensitive dentine. There is quite a diversity of opinion as to the use of chloride of zinc. Does not like it in the crystal form; for, as the crystal must deliquesce before it can act, why not do it outside of the mouth as well as in it? Recognized in it one of the very finest articles in the dental pharmacopœia, extending as it does all the way from the mildest and most soothing cleanser to a powerful escharotic. In order to use it properly one must understand it. It is a most beautiful application in cases of attempted devitalization of a pulp where it is almost dead and a portion still alive at the apex of the root. You cannot place arsenic in contact with this, but with a fine probe you can prick chloride of zinc through the living portion.

Prof. McQuillen. Would not call into question the veracity of gentlemen who claim to have met with invariable success in the use of oxychloride of zinc. It was quite the reverse, however, in his own

experience in applying that article to exposed pulps. The pain endured by some of his patients after applying the agent, and the exquisite suffering which he himself had undergone on one occasion, had induced him to abandon its use. He had exercised the greatest care in making the applications himself, and the gentleman who had treated his tooth had been equally careful in performing the operation. The pain experienced in his own case was of the most aggravating character, and he was compelled to remove the oxychloride of zinc filling in the middle of the night. This gave immediate relief. The pulp was subsequently treated with arsenical paste, extirpated, and the cavity filled. The tooth has since been perfectly comfortable and useful.

Dr. Darby. In capping pulps with oxychloride of zinc, his experience differed materially from that of some of the other gentlemen. Fourteen years ago, when he was a student with his preceptor, he found the pulp exposed in a first superior molar in his own mouth, and proposed capping it with oxychloride of zinc, which he did, filling the balance of the cavity with amalgam. The tooth ached for half an hour, and the pain then subsided. Several years afterwards the amalgam was removed and replaced by gold. The tooth was alive and sensitive at the time. Two or three years after this the tooth decayed upon the distal surface and the pulp became exposed, and, after fruitless efforts to devitalize it with arsenic, he had the tooth extracted. He filled some incisor teeth for a gentleman thirteen or fourteen years ago, in which the pulps were exposed, and capped them with oxychloride of zinc. These teeth have remained comfortable all these years, and are to-day in good order and are apparently living, healthy teeth. He had seen, a few days since, a young lady, in whose mouth he had capped the pulps of four incisors and two molars between six and seven years ago. They had never given her the slightest pain, and are as white as any teeth in her mouth, and sensitive to extreme cold. He does not hesitate to cap all recent exposures. Would not expect to succeed in cases where the pulp had been long exposed and irritated; but, so far as he was aware, he had not failed except in two cases. If others have proved failures they had not returned to him for treatment, and he thought he should have known it had they not been successful. Whenever he finds it necessary to expose the pulp in excavating preparatory to filling, he wipes the cavity out carefully with creasote, then mixes the oxychloride very thick, like putty, and covers the exposure carefully, and in fifteen or twenty minutes thereafter fills with gold. Was in the habit of painting the gum around the tooth with iodine or a strong tincture of capsicum, to get up a little counter-irritation. Only yesterday he capped the pulp of a large molar tooth, and fifteen minutes after filled it permanently with gold, taking not less than an hour or an hour and a half. He was almost confident the operation would prove

a success. If his practice in this department of operative dentistry is a failure, he is not aware of it, nor can he understand why others meet with so little success.

Prof. Garretson. At this point would assume to change the current of thought, by asserting that oxychloride of zinc is the best material for capping exposed pulps. It is an agent that does not yield like gutta-percha. It does not require as much force as does the metal-foil plug to make it. He thought that its disadvantages lay solely in its being an irritant. Thought that the cause of failure was the fact that the gentlemen did not consider the nervous susceptibility of their patients. The practice suggested by Prof. Flagg was not in his judgment as good as that species of derivation which was to be found in the employment of *veratrum viride*, for by it you could reduce the pulp-circulation as you reduced the circulation at large; when, on the contrary, counter-irritation is employed,—the point of irritation being made upon the gum,—it is not unfrequently the case that the primary discomfort is increased, as the result of additional vascular action excited by the thing applied. When counter-irritation is used for the relief of a weak or yielding part that has become congested, the irritant should not be applied too near. The nape of the neck is a good place as far as the mouth-inflammations are concerned.

Dr. Guilford. Has been in the habit of capping exposed pulps with the oxychloride of zinc for the past ten years. His failures in the beginning were many, owing doubtless to inexperience, the mixing of his preparation too thin, and the absence of any intervening substance. Since then, however, he had reason to believe that his successes have been numerous and his failures few. Within the past three or four years he had followed the plan suggested by Dr. Francis, of New York, which is in effect that of laying a piece of paper dipped in balsam of fir over the exposed part before applying the oxychloride. He took a piece of Japanese bibulous paper and folded it to three or four thicknesses, then cut it into a disk of about three times the size of the point exposed. The balsam should be reduced by adding to it an equal quantity of chloroform. After the saturated paper is placed in position the oxychloride is mixed as thick as possible, rolled into a small pill, laid over the paper, and pressed down with a pellet of bibulous paper carried on the point of a pair of tweezers. The balsam is very grateful to the wounded part. The paper is a protection and non-conductor, and the oxychloride, mixed thick, gives the minimum quantity of the chloride or irritating property. Very little pain follows the application thus made; and where there is the least pain, certainly the chances of success are the best. He did not make a practice of capping where the exposure had been of long standing or was very large in extent. He also discriminated in the cases. In persons of a nervo-sanguine tem-

perament we rarely succeed ; while in the bilious, nearly always, if the person be in good health. He had known plaster of Paris to be used instead of oxychloride, and, owing to its non-irritant properties, it made quite a good capping ; but it lacks the hardness and strength of the zinc, and this is essential where a gold filling is to be placed over it.

Prof. Flagg. In patients of bilious or bilio-sanguine temperaments, thinks he can cap with some success. He sometimes mixes oil of cloves with his oxychloride of zinc. He thinks that it does not make much difference whether it be mixed to a creamy consistency or not ; but that the main difference in the event of failure or success is due to the condition of the pulps treated and the systemic and temperamental attributes pertaining to the patients.

Adjourned.

AMERICAN ACADEMY OF DENTAL SCIENCE.

AT the December monthly meeting of the American Academy of Dental Science, Dr. D. M. Parker, member of the Centennial Board of State Managers and president of the academy, in the chair, it was voted unanimously that the academy shall endeavor to present, in some suitable manner, the claims of dentistry, or, more properly, of "oral science," at the coming Centennial at Philadelphia. A committee of ten was appointed to make the necessary arrangements, and they have held weekly meetings from that time to the present. To this committee have been added, as "advisory members," representative men throughout the country.

In order to still further aid the committee in this undertaking, they now request the co-operation of all members of the profession who may be interested in the movement, and would solicit any information pertinent to the subject that any one may have in his power to give.

They particularly desire *facts* relative to the early history of the profession in this country, as to individual practitioners, and the efforts at securing a suitable and thorough *education* in this *specialty* of *medicine* that have been made.

All information bearing upon the above points will be gratefully received by the committee, and may be sent to

GEORGE T. MOFFATT, M.D.,

Secretary of the Committee,

No. 1 Hotel Boylston, Boston, Mass.

MASSACHUSETTS DENTAL SOCIETY.

THE annual meeting of the Massachusetts Dental Society was held on Thursday and Friday, December 9th and 10th, 1875. Dr. J. S. Hurlburt, of Springfield, presided.

Various reports of interest were read and discussed, and a series of resolutions adopted expressive of the sense of the society of the worth of Dr. N. C. Keep, the first president of the society, Dr. Edmund Blake, vice-president, and Dr. Enoch C. Rolfe, one of the oldest members, all of whom have died during the past year.

A committee, consisting of Drs. George T. Moffatt, J. H. Batchelder, N. W. Hawes, Jr., S. H. McDougal, and J. S. Hurlburt, was appointed to consider what legislative action is necessary to regulate the practice of dentistry in this State. The following gentlemen were elected officers for the ensuing year :

President.—Dr. John T. Codman, of Boston.

Vice-Presidents.—Dr. D. G. Harrington, of Newton; Dr. A. M. Dudley, of Danvers.

Recording Secretary.—Dr. G. F. Grant, of Boston.

Corresponding Secretary.—Dr. T. H. Chandler, of Boston.

Treasurer.—Dr. E. Page, of Boston.

Executive Committee.—Drs. Thomas Cogswell, J. S. Hurlburt, E. T. Bradbury, T. O. Loveland, and A. M. Dudley.

The next semi-annual meeting of the society will be held at Martha's Vineyard.

SOUTHERN DENTAL ASSOCIATION.

THE eighth annual session of the Southern Dental Association will convene in the city of Nashville, Tennessee, Tuesday, April 11th, 1876. All members of good standing in the profession are cordially invited to attend.

J. F. THOMPSON, *Secretary.*

TO THE ALUMNI OF THE BALTIMORE COLLEGE OF DENTAL SURGERY.

A MEETING of the graduates of the Baltimore College of Dental Surgery, for the purpose of organizing an Alumni Association, will be held at the College Building, Baltimore City, on Wednesday, March 8th, 1876, at twelve noon. The annual commencement will take place on the Friday following, March 10th, 1876.

JOHN W. FARMER, D.D.S., M.D.

GEORGE F. KEESEE, D.D.S.

EDITORIAL.

ETHICS OF JOURNALISM.

No principle in journalism is, we think, better established than that which requires editors to credit selected articles to the source whence they are obtained. When such credit is omitted, it is a charitable conclusion that the omission was unintentional. Surely the editor of any respectable journal should be glad to have his attention called to such an oversight that he might hasten to correct it.

With these convictions, we respectfully request the editor of the *Pennsylvania Journal of Dental Science* to inform his readers that the paper of Dr. C. N. Peirce, on "The Lower Forms of Life found within the Oral Cavity," which appeared in the January issue of that journal as an original communication, and to which special attention was called editorially, was copied, illustrations and all, from the DENTAL COSMOS for September, 1875.

We would also request the editor of the *Missouri Dental Journal* to inform his readers that the paper of Dr. A. H. Thompson, on "The Evolution of Food as Inducing the Subversion of Mastication," which appeared in the December issue of that journal, was copied from the DENTAL COSMOS for the same month.

We would also request the editor of the *American Journal of Dental Science* to inform his readers that the report of the fourth day's proceedings of the American Dental Association, in the January issue of that journal, was copied from the DENTAL COSMOS for December, 1875.

This sort of thing is getting to be monotonous.

In this connection, though without application to either of the writers named above, as we have taken the pains to ascertain, we call the attention of correspondents to the impropriety of sending the same paper as an original communication to more than one journal. A writer should make up his mind in which journal he would prefer to have his communication appear, and send it to that one alone, leaving it for others to copy if they desire. It is annoying to an editor to find that he has been placed in a false position by reason of the non-observance of this common-sense rule. We have recently had several narrow escapes from this predicament by finding in other journals articles which we had accepted and marked for publication. We will thank contributors not to subject us to such unpleasant experiences.

VERNON GALBRAY.

IN the department of *Hints and Queries* of the DENTAL COSMOS for November there appeared a notice of a book which had recently been published anonymously in London, under the title "Vernon Galbray, or, the Empiric: The History of a Quack Dentist." The writer of the review (a practicing dentist, and a frequent contributor to the pages of the DENTAL COSMOS) was led, by a paragraph in the appendix, to the conclusion that the volume was a "cunningly-devised advertisement of a well-known dental depot," and so expressed himself. That this conclusion was erroneous we were informed by a polite note from the Messrs. Ash, of London, to whom the paragraph in the review evidently referred. Their disclaimer was published in the DENTAL COSMOS for January. In the present number we give place to a portion of a letter from one Felix Weiss, who claims the authorship of "Vernon Galbray."

We regret that the objectionable paragraph had not been more closely scanned, and expunged, and we acknowledge that its publication was an inadvertence. This much in simple justice to the Messrs. Ash.

We regret, also, that the review has been the occasion of calling into undeserved prominence the book in question, as well as its author, who ventilates his bad temper and worse grammar in the *British Journal of Dental Science* and in the *Monthly Review of Dental Surgery*, accusing the editor of the DENTAL COSMOS of writing the article in question, gratuitously suggesting, moreover, motives for its publication, the insinuation of which shows him to have had some experience in human depravity.

Having cheerfully made the *amende honorable* to the Messrs. Ash, we are glad to accord to Mr. Weiss all the glory of the authorship of "Vernon Galbray."

RUBBER VERSUS CELLULOID.

THE following correspondence will be read with interest by the dental profession. We make no apology for its publication, and it needs no comment.—*Editor DENTAL COSMOS.*

OFFICE OF THE CELLULOID MANUFACTURING CO.,
NEWARK, N. J., December 28th, 1875.

S. S. WHITE, Esq., Philadelphia.

DEAR SIR,—The inclosed letter of Mr. Hamilton, addressed to me, explaining the case of Goodyear Dental Vulcanite Company and Josiah Bacon against Flagg, will give you the situation better than if I undertook the explanation myself. You are probably aware that the movement of Josiah Bacon in Baltimore last week, in which an attempt was

again made to introduce the subject of Celluloid in connection with the vulcanite rubber dental plates, and which they were obliged to withdraw as soon as we appeared by counsel, is another evidence of their attempts, by all underhanded means, to steal a march upon us, instead of meeting the issue square upon its merits.

Yours truly,

MARSHALL LEFFERTS, *President.*

NEW YORK, December 23d, 1875.

MARSHALL LEFFERTS, ESQ., *President of the Celluloid Manufacturing Company.*

DEAR SIR,—The Goodyear Dental Vulcanite Company and Josiah Bacon have this day voluntarily withdrawn the suit against Dr. Eben M. Flagg, which they brought, you will remember, for the purpose of enjoining Dr. Flagg from the use of Celluloid in making dental plates, and have consented to pay Dr. Flagg's costs rather than pursue the case any further.

In view of the long-continued threats by Mr. Bacon and his Company to prosecute and punish dentists daring to use Celluloid for dental plates, it is proper that you should be informed of the circumstances under which this suit was begun and ended. It was begun under the most favorable circumstances for the Goodyear Company and Mr. Bacon. They had several years in which to collect their evidence and to prepare for trial. They chose their own court and their own place of trial, their own defendant and their own time. They chose to begin the suit in midsummer, when lawyers are absent from the city on their vacation. They could not have a better case against any one than they had against Dr. Flagg, as it was admitted beyond question and in the clearest manner that he had for over a year used Celluloid in making dental plates, and had infringed the Cummings patent, if the use of Celluloid constituted any infringement.

If the complainants sincerely desired a test case this surely was a favorable one for them. The Celluloid Company were glad of this opportunity to finally put an end to the threats of the Goodyear Company and Mr. Bacon.

The complainants at the commencement of the suit made a motion before Judge Blatchford, in New York, for a preliminary injunction, using on that motion the evidence they had so long been accumulating, —using also the affidavits of Josiah Bacon; of G. H. P. Flagg, a dentist of Boston; of Dubois B. Parmelee, a chemist; of Henry B. Renwick, an expert; and of Henry I. Fisk.

They also referred to the printed record in the Smith case and to the previous decisions in their favor, and they presented to the Court, as

exhibits for examination, metal dental plates, vulcanite dental plates, and Celluloid dental plates. In short, it seems that the complainants used on that motion everything of fact or of law that could, in the opinion of their experienced counsel, aid them in any way.

The motion was argued by Messrs. E. N. Dickerson and B. F. Lee, for the complainants, and by Judge William D. Shipman, Clarence A. Seward, and E. Luther Hamilton, for Dr. Flagg. Elaborate printed briefs were submitted to Judge Blatchford by the counsel for both parties. As soon as the motion was submitted to Judge Blatchford, and while he had the matter under consideration, Dr. Flagg, who was anxious to bring the case on for a speedy trial, applied to the Court and obtained an order to compel the complainants to put in their proof by a certain fixed day.

The time fixed by that order expired this afternoon.

On December 7th, Judge Blatchford rendered his decision denying their motion for a preliminary injunction, and filed the following opinion in the case:

UNITED STATES CIRCUIT COURT.

Southern District of New York.

THE GOODYEAR DENTAL VULCANITE COMPANY AND OTHERS.

vs.

EBEN M. FLAGG.

BLATCHFORD, J.

"I do not find that any decision has been made in regard to the plaintiff's patent which gives to it such a construction as necessarily includes the process and substance used by the defendant. In the Gardner case the defendant did not compound India-rubber with sulphur, but he compounded India-rubber with iodine, and he employed heat to harden the rubber. (*Goodyear Dental Vulcanite Company vs. Gardner*, 4 *Fisher's Patent Cases*, 224, 231.)

"In the Smith case the view of the Court was that the material to be used under the plaintiff's patent in carrying out the invention patented was to be India-rubber, 'and the compounds commonly employed therewith reduced to a soft plastic condition, capable of vulcanization and subsequently vulcanized.' (*Goodyear Dental Company vs. Smith*, 5 *Official Gazette of Patent Office*, 585.)

"It appears, from the description of the process used by the defendant in this suit, that he does not use India-rubber or any substance capable of vulcanization. That the substance he uses is one which is rendered plastic by heat, and is not hardened by heat. That heat is used in the process to soften the substance and render it plastic and not to harden it, and that the substance after being moulded is hardened by being

cooled. It is not sufficiently clear that this process is embraced in the claim of the plaintiff's patent to warrant the granting of an injunction until one is awarded as the result of a decree for the plaintiffs on final hearing."

Instead of proceeding with the case and putting in their proofs as the Court had ordered them to do, the complainants this afternoon discontinued and dismissed the suit, and consented to pay Dr. Flagg's costs rather than to go on. The complainants have thus chosen to back out of a suit instituted by themselves and brought, as they pretended, to test the question between vulcanite and Celluloid. Judge Blatchford's decision on their motion was the shadow of the coming event, which no doubt induced them to withdraw the suit.

(Signed) Yours truly,
E. LUTHER HAMILTON, *Solicitor for Dr. Flagg.*

PERISCOPE.

THE PROFESSIONAL EDUCATION OF DENTISTS.—Judging from the occasional agitation of the question in medical and dental journals, I think a good many of our brethren who cultivate dentistry are sorely puzzled as to their exact status. They do not seem to know whether they are medical men who devote themselves merely to a branch of special surgical practice, or whether they are dentists, purely such, following a specialty of their own, which they admit has many medical and surgical ramifications. If the former, they might with propriety be considered as a part of our own profession, and a more thorough education to that end be expedient in connection with the courses in our medical schools. If the latter, they have no such claim, and it remains to be seen how far they can themselves meet the requirements for a thorough education in this specialty. It is said that the number of operators in this country is from ten to thirteen thousand. Many of these have doubtless entered upon the practice of dentistry without capping their education with the degree, for we find that only about two thousand have received this "graduate" evidence of proficiency from dental colleges. How many of these men pursue the occupation as a mere money-making trade, apart from all scientific considerations, we cannot easily conjecture. Every effort to raise the standard of education for dentists must expect the opposition of many of those who are unauthorizedly pursuing this calling. At a meeting of the New York Odontological Society, held not long since, it was argued by one gentleman that dentistry, to attain a greater elevation in the professional plane, must be merged in oral surgery; that the oral surgeon should be educated and experienced, as is the ordinary medical man; that the needs of the student direct to a medical school, from which *alma mater* he can pass to the special clinical studies of his selected specialty—to a special clinical hospital; that the special degree of dentistry should be abolished, and the dental converted into medical schools; that the time is near at hand when dentists are to decide whether they will develop into skillful surgeons

or remain mere mechanics. It was stated that several of the medical colleges are ready to act, when invited to do so, and to give the proper facilities for the consolidation of the two professions—if we may so style both. These progressive views, of course, met with much opposition, and the general sentiment of the society seemed hostile to the change. —*Philadelphia Correspondence of Medical Times and Gazette.*

COMPULSORY REGISTRATION OF DENTISTS.—Sir,—Will you kindly permit me to make a few remarks concerning a recent provincial meeting which was convened with the object of obtaining aid from Parliament to insure the compulsory registration of dentists?

I most thoroughly agree with the intelligent criticism upon this subject which recently appeared in your journal.

The conclave was composed, with few exceptions, of unqualified members of the profession; and, although it is satisfactory to find that all ranks are being aroused to the necessity of improving the status of their calling, I fear that the result of this meeting may not be that speedy success which its promoters anticipate. Moreover, it is to be regretted that the means employed to enlist the sympathies of those taking the highest rank in the profession are not by any means the best calculated to attain that end, inasmuch as I have just received a paper giving a notice of the above-mentioned meeting, in which is inclosed a thin tablet of cork of cunning workmanship, on which is imprinted an advertisement recommending certain "plastic fillings" to be obtained of one who took a prominent part in this movement for the promotion of dental reform. Now, although this can only be looked upon in the light of a trade circular, still it is certainly a paradox to see it inclosed with a scheme for "dental reform."

The only true reform must consist in higher and more perfect education; and there need be no fear lest dental surgery should not take its legitimate position immediately a majority of those who practice the specialty become fully qualified practitioners. You still insist upon the necessity of separating the mechanical from the more purely surgical part of dental practice, and, at the risk of giving offense to some less liberal members of the profession, I frankly confess that I think that such a consummation is devoutly to be wished; for I am convinced that it is this connection which has brought much that is undesirable into our ranks, though I cannot see that the union of the two branches converts a profession into a business more than the retailing of drugs by the general practitioner who compounds his own prescriptions.

The manufacture of mechanical substitutes for the natural denture I would gladly relegate to a body of skilled mechanicians, who should hold a similar position to that of the ordinary manufacturer of surgical appliances; the instruments being made and adjusted subject to the supervision of the surgeon, who, especially in dental practice, ought to have a competent knowledge of mechanics, as a mere mechanist might fail in that æsthetic, artistic, and anatomical perception which is necessary in cases of deformity like those alluded to here.

But this division will not achieve all that which is to be desired; for those who are ambitious of the highest professional and social position must enter their profession through a portal, the entrance to which should imply a liberal education, both general and special; and this is to be found in the diploma of Member of the Royal College of Surgeons, to which it is to be regretted that the special degree in dental surgery

was not primarily appended. One of our most distinguished and celebrated surgeons lately said, whilst speaking authoritatively in the name of the Royal College of Surgeons, that that body would be only too glad to receive the best men of that specialty into its fold; and I likewise believe that those men would infinitely prefer that connection to any other. Speaking for myself, and I believe for some others, I desire no other position than that which I have as a qualified surgeon. I trust that ere long every general hospital will have a special department for instruction in dental diseases, as for those of the eye, throat, or ear; for I am certain that the attempt to separate the profession of dental surgery from that of general surgery would be a great mistake. Had the diploma of Licentiate of Dental Surgery been only conferred as a pendant to that of M.R.C.S., the coveted means of registration would have been thereby obtained at once. Still, although it is to be feared that a special registration would have a tendency towards the separation of the general and special branches, yet, on the principle of choosing the least of two evils, I believe that, if that registration could be made to depend upon the possession of the diploma of L.D.S., so that none should practice without this *minimum* degree, the profession would be purged of much that is unclean and unhealthy in its ranks; above all, of that advertising class which makes a sensitive man occasionally blush for the name of his profession. To such a project I would give support, though I should esteem it a matter of regret if this should lead to such a separation as that to which I have referred. In America such a mistake has been made, and we find that the children are now seeking a connection which the parent justly disclaims, save on the condition that they educate themselves as fully qualified practitioners. Let us take warning from that example, and determine to ally ourselves with those from whom to be divided would be a loss of honor in a professional as well as in a social point of view.

Finally, if specialists are ambitious of the status granted to their medical *confrères*, they have only to educate themselves as they are educated. Let them take a larger and more liberal view of their calling, banishing all petty jealousies and intestine bickerings. Let them advance schemes for the common weal, apart from mere personal interest and the gratification of individual ambition, and there would then be no difficulty about special registration, whilst men who now hold aloof from special politics, and the general body of those practicing the specialty they have adopted, would join the van of those who love the good name and support the fair fame of their profession in word and action.—*S. Hamilton Cartwright, Professor of Dental Surgery and Lecturer at the London School of Dental Surgery, in British Medical Journal.*

COMPULSORY REGISTRATION OF DENTISTS.—Sir,—I shall esteem it a favor if you will permit me to state that I fully sympathize with Mr. S. Hamilton Cartwright's views as expressed in his letter to you of the 30th ult. It is pretty generally known that I endeavored, some years ago, to bring about the wholesome reform which he advocates; but I was forced to retire, because I found that I should have to fight the battle almost single-handed.

I regret that I am at present unable to take up in detail the various matters of which Mr. Cartwright's letter treats, as, with your permission, I may possibly do at some future time; but it may be serviceable

to the cause he advocates, to mention in the mean time that I have for some years past conducted my own practice upon the system which he would be glad to see extended, and have deputed to skilled mechanics all work that may be defined as actually mechanical; and these execute my orders out of the house, and bring the results for my supervision and adjustment precisely in the same way that surgical-instrument-makers carry out the instructions of an operating surgeon.—*William Donald Napier, in British Medical Journal.*

THE DENTAL PROFESSION.—Sir,—I cordially agree with every word in your recent leader on the above subject, and I would like to say, in language a little plainer than the hint you gave, that it is much to be regretted that dentists composing the majority at the Manchester meeting had not strengthened the claims of the profession by obtaining a recognized diploma before entering upon the present agitation. It is just possible that if a *comparatively large* body of highly-qualified dentists existed, they might obtain for their profession the protective legislation which the Manchester meeting hope to carry; but the fact cannot be disguised, that although a considerable number of men of high professional qualification do practice dentistry, and that the profession comprises a respectable number who add F.R.S., F. or M.R.C.S., and L.D.S. to their names, the vast majority are men without qualification or claim to any qualification whatever. No doubt these latter gentlemen would be delighted to have it in their power to dub themselves “legally qualified dentists;” but I agree with you, sir, that they cannot obtain the privilege they desire. If I thought there were any chance of their doing so, I should at once commence an agitation against them, and I have little doubt the General Medical Council would also feel inclined to move in the matter, and to prevent the confusion which would arise from the creation of a distinct quasi-medical profession having greater protection than actual practitioners of medicine. The confusion which might arise from the creation of such a class is well illustrated by some remarks in a letter of L.D.S.R.C.S. in a recent number. This gentleman appears to believe that in virtue of his diploma he is entitled to administer anæsthetics involving risk to life. Let me tell him that, if he meets with a fatal accident, he will find, perhaps (if he fall into the hands of a *medical* coroner who knows the law), his diploma in *dentistry* a poor shield from an accident occurring in the practice of *medicine*, and I would recommend him either to obtain a medical diploma or the assistance of a qualified practitioner when he performs dangerous operations, such as the administration of anæsthetics, falling beyond the legitimate scope of dentistry. If dentists holding only a dental diploma were allowed to consider themselves legally entitled to practice one part of medicine, you may rely upon it some or many would consider themselves justified in going far beyond the dangerous step taken by L.D.S. in merely administering “gas.” There are few diseases which the legally qualified, but actually unqualified, dentist might not dabble in.

The qualified members of the dental profession are not worse off with regard to quackery than qualified medical men, and there is no doubt that it is not penal legislation, but rather the improvement of the profession and gradual enlightenment of the public which has in late years tended to diminish the number of quack doctors. The same causes are at work in the dental profession. It contains a fair propor-

tion of men who present the greatest possible contrast to the charlatans and unqualified practitioners who disgrace the profession, and I venture to affirm that the public are rapidly becoming educated in discriminating between these classes. A dental surgeon of good qualifications and education is but little injured by the quacks; it is those unfortunate practitioners who are destitute of education (professional or other), and who are either unwilling or ashamed to advertise, who cannot successfully compete with the charlatan, who, having as much right to practice, takes care to attract patients by advertisements.

You have shown clearly that the proposed legislation would not prevent quackery, and I was glad to hear at the distribution of prizes to the dental students, Sir James Paget echoed your remarks, and supported them by similar arguments. It is not necessary to examine further the statements contained in the letter of L.D.S.R.C.S., since those which I have not mentioned are sufficiently refuted in your article which preceded and called forth his letter.—*M.R.C.S., L.D.S., in Med. Press and Circular.*

WHY MAY NOT THE DENTIST ADVERTISE?— . . . I presume that a dentist may wish to conduct his so called business in a professional manner; that is one reason why he may not advertise. Then we must ask, What has a dentist to advertise? Is there anything he can say in an advertisement which may not be a lie from beginning to end so far as the public is able to judge? If he lay claim to superiority over other dentists, he is simply a pretentious humbug appealing to a public utterly unqualified to form an opinion. If he pretend to cheapness, he is only misleading people. There are hundreds of respectable practitioners who are willing to give their services on the most modest scale of remuneration, but who do not go to the expense of advertising, knowing well that it must be paid for by their clients, and that their profits do not leave a sufficient margin for such extravagances. As to the exhibition of well-made teeth in shop-windows, I do not know what the writer may mean by well-made teeth; but when a man of education, and, we must suppose, of professional feeling, uses such expressions towards the show-pieces seen in windows and boxes, we can hardly be surprised at uneducated people being led away by appearances. In what way well made, I ask? If the highest modeling skill and the best mechanical ingenuity were combined in making such cases, would that constitute one of them an article of utility to any one of the thousands who may gaze in ignorance at the well-made imitations of nature? I say the dentist may not exhibit specimens because they are a delusion and a snare. They are baits for the ignorant, and may be bought and exhibited by men who could no more reproduce them than they could fly. . . . —*J. Smith Turner, M.R.C.S., L.D.S., in British Journal of Dental Science.*

THE USE OF ANÆSTHETICS IN EXTRACTION OF TEETH.—Dr. T. Lauder Brunton's "Remarks on one of the Causes of Death during the Extraction of Teeth under Chloroform" in the *Journal* of December 4th, resting on a sound basis of careful physiological research, are of the utmost value to the now anxious administrators of chloroform. For "the extraction of teeth," however, surely chloroform is a thing of the past; its successor, nitrous oxide, carefully prepared and administered, being equal to every requirement, and having almost a blameless reputation. My

experience in the extraction of teeth extends over many years; and, till the introduction of nitrous oxide, I was daily extracting while chloroform was being administered. I therefore feel warranted in giving my opinion that, happily, chloroform is no longer necessary in any case for the painless extraction of teeth; and I am anxious lest it should be inferred from the title of Dr. Brunton's paper that its employment in such cases is still not unusual, and lest any should be led, because familiar with its use, to advise the inhalation of chloroform, rather than the nitrous oxide, by those patients. In every respect but one, nitrous oxide seems to me preferable to chloroform in the extraction of teeth; the exception being that, under the oxide, the operation must be over in one minute, while, under chloroform, it may occupy many minutes. But sixty seconds suffice to remove several ordinary teeth; and as cases of acute suffering seldom, if ever, arise from more than two teeth or roots, ample time is afforded for their extraction. When many teeth or roots have to be extracted to prepare for artificial teeth, as convenience alone urges their extraction at one visit under chloroform, the operator should not hesitate to object to its administration, insisting on their being extracted at sufficient intervals under the nitrous oxide.—*A. Stewart, F.R.C.S.E., in British Medical Journal.*

EXTRACTION OF TEETH UNDER CHLOROFORM.—Dr. Lauder Brunton has, no doubt, made out a case in support of the rule which he lays down for preventing death during the extraction of teeth under chloroform. I say rule; because the second of the rules which he mentions has been, I believe, long recognized and acted upon in the administration of chloroform. It has been the custom of most experienced chloroformists to administer the anæsthetic, in all but exceptional cases, to the patient in the recumbent position; but it has certainly not been usual in dental operations to render the patient so deeply insensible as to produce *total abolition of reflex action*. Although Dr. Brunton has made out a case in favor of his rule, still there is much to be said against it; and not the least objection consists in the fact that, in operations about the mouth, the more profoundly unconscious the patient, the greater the danger of entry of blood or foreign bodies into the glottis, and the less the power of the patient to resist their effects and to expel them. For Dr. Brunton's words of advice to those about to give chloroform in dental operations, I should like to substitute the one word—don't. Chloroform, undoubtedly, at the present state of our knowledge of its mode of action and our means of combating its deadly effects when they appear, is always dangerous to life; and the danger is so insidious in most cases, that it is impossible with certainty to guard against it. Now, the instances in which it is justifiable to risk life in an operation like tooth-extraction, are extremely rare; and even if no safer anæsthetic were available, the employment of chloroform would be, in my opinion, indefensible. But we have now an agent, the nitrous oxide gas, which by physiological and practical experiment has been demonstrated—to say the least—to be much less dangerous to life than chloroform; besides which, it possesses advantages over every other agent for the production of insensibility during tooth-extraction. It is extremely rapid in its action, and transient in its effect; from sixty to eighty seconds of inhalation sufficing to produce complete anæsthesia, and less than a minute being enough to allow complete recovery. It produces no excitement or struggling during exhibition, neither is it followed by

nausea, vomiting, *malaise*, headache, depression, or any of the common distressing sequels of chloroform-anæsthesia. With it, also, it is always possible to fix the patient's mouth easily, safely, and firmly open, before the administration by the mere insertion between the teeth of a simple prop; whilst with chloroform, unless a cumbrous gag be used, or unless the patient be profoundly narcotized, the opening and fixing open of the mouth are frequently to be accomplished only with extreme difficulty.—*Henry Sewill, M.R.C.S., in British Medical Journal.*

EXTRACTION OF TEETH UNDER CHLOROFORM.—Sir,—In his able paper on “One of the Causes of Death during the Extraction of Teeth under Chloroform,” Dr. Brunton has shown his usual acumen both in interpreting the intricate physiological processes which may induce death by shock, and in his plausible hypothesis *ex hypothesi* to account for death during a minor operation under chloroform, by supposing that, in such cases, too small a quantity of the anæsthetic has been given. We have, alas! too many well authenticated cases of death after small doses of this dangerous agent, wherein “shock after operation” could not possibly form a factor in the case. (Only last week, we see recorded the death of a lady in her bed after a comparatively small dose of chloroform.) That shock may, in a few isolated cases, be the cause of death after a minor operation, I do not deny, although I have never heard of a case of even temporary stoppage of the heart's action after the extraction of a tooth; but it would lead to a very dangerous course of practice were we to assume that, in cases of death after the administration of chloroform, too small a quantity of the anæsthetic had been used.—*A. H. H., in British Medical Journal.*

THE ADVANTAGES OF ETHER OVER CHLOROFORM.— . . . And now, gentlemen, I have done. I have been obliged, from a regard to time, to leave unsaid much that I should like to have said concerning anæsthetics,—concerning more especially the relative values of the various methods of administration. I have been obliged to omit all mention of many little practical details which I have acquired in a somewhat lengthened experience of the employment of chloroform and ether. But I have striven to confine myself to the question before me, and to discuss fairly, which is the better anæsthetic, ether or chloroform? I have endeavored to justify my conclusion that ether must have the preference. I hope I shall not be misunderstood when I say that, on giving up chloroform, I had to overcome that kind of prejudice which springs from habit. We ought to have no prejudices in such matters as those before us; we can none of us advance in scientific or in any other kind of truth until we can more or less completely get rid of prejudice. Its “rotten pales” should never confine us. But I was insensibly and not unnaturally biased towards chloroform, because I had given it largely for several years, because I had given it safely more than a thousand times. But I have had a growing sense of the danger of chloroform; and the results of my reading and of my experience, and my sense of duty towards those who have been placed in my hands, have led me to give up its use for that of ether.—*Dr. James Sawyer, Clinical Lecture, in British Medical Journal.*

OBLITERATION OF DEPRESSED CICATRICES.—At a late period of the evening Mr. W. Adams exhibited a patient on whom he had operated

for obliteration of depressed cicatrices. The patient, Miss S——, aged twenty-six, had presented four cicatrices on the neck, one of large size on each side below and behind the angle of the jaw, and one on each side under the jaw towards the chin, the two latter being of small size, but deeply depressed, with adhesions to the bones. Of the two former the one on the right side was deeply depressed and adherent to the bone, but the corresponding one on the left side was not depressed. All these cicatrices were the result of abscesses caused by necrosis of the jaw-bone proceeding from difficult dentition in cutting the wisdom-teeth at the age of twenty. The teeth had been extracted with difficulty, but small portions of bone continued to come away for several years, and all the molar and some other teeth on both sides of the lower jaw had to be removed. The operation performed for the large depressed cicatrix on the right side consisted in subcutaneous division of all the deep adhesions, and then thorough eversion of the cicatrix, turning it as it were inside out, and keeping the cicatricial tissue raised by two needles passed through its base. This tissue, at the time swollen and infiltrated, gradually sank to the level of the surrounding skin after the removal of the needles on the third day. Since the operation, performed more than three years ago, there had been no disposition whatever to a return of the depression, and but a very slight trace remains of the cicatrix. The two smaller cicatrices had been excised, but in one of these depression returned, and at the desire of the patient the subcutaneous operation was performed a month ago, and to all appearances is perfectly successful. Mr. Adams, in conclusion, remarked that the present case was the third in which he had operated by this subcutaneous method, first suggested and performed by himself in March, 1864.—*Reports of Medical Society of London, in The Lancet.*

OBSERVATIONS IN ENGLISH HOSPITALS.—In Mr. Hutchinson's service I saw many cases of syphilitic eye-disease, and especially those forms dependent upon inherited syphilis, which Mr. Hutchinson has done so much to elucidate. The characteristic "notched teeth" are not the only evidence presented by the unfortunate victim of the sins of his ancestors. Mr. Hutchinson pointed out numerous indications which will aid materially in confirming a doubtful diagnosis. One of the most marked of these is the prominence of the protuberances of the frontal bones on each side. In some cases they stand out like large exostoses, presenting an appearance which, when once seen, can never afterwards be mistaken. A silken feel and appearance of the skin is also very often found in the subjects of inherited syphilis. All these manifestations are most marked in the first-born. As regards the notched teeth, he now lays more and more stress upon the single notch. We also saw in his service quite a number of cases of what he calls the mercurial teeth,—a deformity resulting, as he contends, from the administration of mercury during childhood. It consists essentially of an absence of enamel, and is most evident in the first molars, if they are present, though they are generally gone. The dentine runs up through what enamel there is, in the form of turrets. The bicuspid are always sound; the incisors and canines are generally deficient in enamel, dwarfed, yellow, with wide spaces between. These mercurial teeth he has frequently seen associated with the notched incisors of inherited syphilis.—*Swan M. Burnett, M.D., in Medical and Surgical Reporter.*

HINTS AND QUERIES.

PIVOT-TEETH.—The following is my method of inserting pivot-teeth: The root is prepared in the ordinary way, with the exception that I enlarge the nerve-canal. (The root should be cut down a little below the margin of the gum on the labial side.) I then fit a hickory pivot, of the length required, to the artificial crown in the usual manner. In nearly all cases I put amalgam in the bottom of the cavity in the root; the amount depending upon the condition of the root and the length of the pivot, being careful always to secure a firm foundation for the pivot in the root. I then press the pivot against the amalgam, and, if necessary, drill out the amalgam with a drill about the size of the pivot. When the tooth can be pressed to its place, I take the pivot out of the crown and put it in the root, and pack amalgam well around it with a small plugger and above the face of the root; then put the crown on the pivot, and drive it to its place with a mallet, using a piece of wood between the tooth and the mallet. I have practiced this method for ten years, and inserted a great many pivot-teeth in this manner with remarkably good success in nearly every instance. I have noticed a number that have been used from five to seven years that remain firm. They do not become offensive, as they frequently do when inserted by other methods.—J. B. WILCOX, *Manistee, Michigan*.

HEMORRHAGE AFTER EXTRACTION—I have a little item which will probably be of some interest to the readers of the DENTAL COSMOS, regarding hemorrhage after the extraction of a tooth.

A young man, aged twenty-two years, came into my office on Saturday, January 1st, 1876, for the purpose of having a superior left second bicuspid extracted, which I did as usual, thinking no more about it.

Sunday forenoon the young man came back complaining of a constant flow of blood from the tooth's socket ever since its extraction. On examination I found the blood spouting out very freely from an artery. I took a pledget of cotton, and saturated it with a solution of carbolic acid and subsulphate of iron, and packed it firmly in the socket, sprinkling pulverized nutgall around the edges. In spite of this the blood kept spurting out as before. I then tried a solution of sulphuric acid and iron on a pledget of cotton, but with no better success.

During all this time I kept his head cool by frequent applications of wet cloths, and his feet warm with hot bricks and blankets, so as to invite the blood from the head. I then heated some wax about as warm as though intended for taking impressions, and packed it thoroughly in the socket, and held it there about half an hour, and then added a little more wax, and directed him to close his lower jaw on it, so as to keep the wax firmly in its place. I then placed a bandage under his jaw, extending over his head, to act as a support as well as to keep the jaw in one position. There was no further hemorrhage.—GEORGE T. GRAY, *Peoria, Ill.*

THERE came to me one day a gentleman with an inflamed eye, and asked my opinion concerning an upper molar, which he thought might hold some relation to the trouble. The tooth had a small cavity in it, not deep, not sensitive. Percussion gave no indication of congestion in or about the roots, for there had been uneasy sensations and severe neuralgic pain in connection with the iritis.

I gave it as my opinion that the tooth was not a *cause*, but might be disturbed by reflex action.

The gentleman being the patient of another, had the tooth extracted a few days after by his dentist. The relief to the eye was almost immediate.

Meeting him several days after the extraction, he gave me the tooth, and I filed off the surface till I came to the pulp-cavity and canals, and found them partially filled with a dried-up parchment-like substance. How such a condition of pulp could have been produced I leave to some one wiser than myself to explain. And how such a husky, lifeless state of the pulp could have produced irritation sufficient to create a very serious iritis I am equally puzzled to explain.

I have met, however, with two other teeth in the mouth of a lady, which were extracted because of a severe periodic neuralgia which resisted all treatment. These teeth on examination had precisely such a condition of pulp. I think they could all have been saved by opening to the pulp and treating as usual for dead pulp.—C. G. DAVIS, *New Bedford, Mass.*

DENTAL EDUCATION.—This is a subject of much interest, and one of the most engrossing of any now before the minds of the profession.

Not, "Shall we be educated?" but "*How* shall we be educated?" "What shall be the course of our preparation?" These and similar questions have been asked, and ably and comprehensively answered.

All are agreed that we, as dentists, if we are to claim any place as members of a liberal profession, must come to a higher standard of professional education. But it seems to me that the subject before us has a wider range and a broader signification than merely in its relation to practitioners of dentistry. Before we can attain to the highest success professionally, and accomplish the utmost good to mankind that lies in our power, the public must be educated in these matters as well as ourselves. A common idea of a dentist is, that he is a man who "pulls teeth." It is astonishing to me, often, to see how prevalent is this idea, and that, too, among those whom one would think ought to know better.

Pre-eminently our province is not to pull teeth, but to *save* teeth, and we can not accomplish this satisfactorily until our patients, and the public generally, are brought to feel the necessity of their pre-ervation. They must be taught that the relations existing between all parts of the human organism are so complete and necessary that very serious and complicated diseases often arise from neglect of the organs of mastication. If they are allowed to decay without attention, disease and death are being constantly taken into the system which must eventually produce their results. We are so organized that we are dependent upon our food for life. This food to be of the highest service to our bodies must be digested. But it cannot be properly digested until it is properly masticated, and it cannot be masticated properly without proper masticating organs. To possess them requires the most scrupulous attention both by patient and dentist.

Again, the public ought to know that there is a wide difference in the value of dental services. The fact that a man can pull or plug teeth does not make him a reliable or desirable dentist. We must teach the people that the services of the best and most trustworthy men are those only which should be sought and are the cheapest in the end. The accomplishment of this object will be of itself the most powerful incentive to thorough and careful preparation on the part of the dentist.

When the public are able to discriminate in these matters, then, and not before, will quackery and empiricism be less abundant in the ranks of the profession which we honor and esteem.

Dr. J. W. White's pamphlet, "*The Teeth*," distributed judiciously among our patients would exert a good influence in this direction, and, at the same time, bring to those who are *worthy* increased patronage.

Dr. Robert Arthur's "Prevention of Decay of the Teeth" is an able treatise, though somewhat too long and too expensive for free and common distribution.

I think that if the profession could be furnished with, *and would use*, some short yet comprehensive book of hints to the public on the care of the teeth, this object of public enlightenment on dental matters would be greatly advanced.

I have simply offered these suggestions, hurriedly and rudely, to awaken thought upon this branch of the subject. We feel the need, here in the West, of a more thorough appreciation of our services; and as soon as the people know the absolute necessity of these services, and can judge of the qualifications of those who profess to be able to render them, we shall have that appreciation and satisfaction in labor and pecuniary reward which it will bring. Educate the people, and it will be a *necessity* for the dentists to educate themselves.—S., *Minneapolis, Minn.*

37, CAVENDISH SQUARE,
LONDON, December 22d, 1875.

TO THE EDITOR OF THE DENTAL COSMOS.

SIR,—In your last number (December) you quote an article on the "Development of the Teeth," by Mr. Sewill. He makes the statement that he believes no account of these matters to have been published in England.

Last summer Mr. Sewill wrote to me, asking the loan of the chapter on this matter from my book on "Dental Anatomy," now in the press. This I fortunately, as the event proved, did not let him have, though his ostensible purpose was not publication, I need hardly say; but I did, *viva voce*, give him an account of the modern view of the process, with which he was then wholly unacquainted. I gave him with my own hands one, perhaps two papers, of my own containing the pith of the matter, and I gave him references to *several* books in English (viz., "Stricker's Histology," and "Quain and Sharpey's Anatomy") in which he would find accurate accounts.

Whether he imagined that his assertion that these views were new to England would escape my eye, I know not; but, as I have chanced to see it in your journal, I beg you will give insertion to this letter.

I am yours, faithfully,
CHARLES S. TOMES.

LONDON, December 6th, 1875.

TO THE EDITOR OF THE "DENTAL COSMOS."

SIR,—In the November number of your journal appears a review of a book published in London and entitled "Vernon Galbray; or, the Empiric." I will thank you to publish the following reply:

1st. The book under notice was written by me and published solely upon my own responsibility.

2d. It was published anonymously for reasons that I thought would be apparent to all, but, my motives having been misunderstood, I have no alternative but now to append my name.

3d. Messrs. Ash & Sons had nothing whatever to do with the composition of the volume, and never read a line of it until delivered to the trade.

* * * * *

I remain, sir, your obedient servant,
FELIX WEISS, L.D.S.R.C.S.E.,
Member Odontological Society, etc.

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, MARCH, 1876.

No. 3.

ORIGINAL COMMUNICATIONS.
DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,
FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

(Continued from page 62.)

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

Nervo-bilious.—It is with some considerable difficulty that the position of this temperament has been assigned in the dento-temperamental group; but it has seemed to me that no other place than the one chosen would be less questionable.

The physical characteristics which denote the nervo-bilious temperament are, rather less than average size; rather less than average osseous, muscular, and contour development; hair dark, and usually decidedly curly, of average quantity and quality; eyebrows decidedly marked, but not so decidedly arched; beard sparsedly and unequally planted, usually mostly upon cheeks, high up, and upon upper lips and chin, leaving a thinly-planted space between; eyes very dark brown, average size, but with much perceptive expression; mouth average; lips thin and shapely; nose usually very shapely, with slight or decided tendency toward aquiline, frequently elegant in form and expression; cheeks high; skin inclined to dark; special senses acute.

The teeth of this temperament are endowed with a combined yellowish and bluish color; the strong exterior (enamel) of the bilious type is joined with the modifying length, narrowness, and cuspieness of the nervous type, together with the sensitiveness and delicacy of organization pertaining to this latter, which is announced in the dentine.

Thus we have the long, narrow, bluish-yellow teeth, which, with strong and polished enamel, permit the formation of large cavities of decay, possessed of comparatively small orifices, and containing, in quantity, layers of semi-decalcified and very sensitive dentine. To this sensitiveness of the dentine we are generally indebted for the prevention of such extended progress of caries as to cause the presentation

of "almost-exposed pulps"; but circumstances beyond the control of patients, through the long list, from unconquerable dread of the operation to the positive prevention of pecuniary inability, will sometimes delay the resort for relief until the pain of frequent and almost continuous toothache has become unendurable.

It is then that this extraordinary compound of elasticity and endurance demonstrates its capability, and, as in systemic conditions, evinces its recuperative energy.

The application of antacids, such, for instance, as precipitated chalk or bicarbonate of soda, in the cavity of decay will oftentimes cause an almost instantaneous cessation of suffering. When this is insufficient, either carbolic acid or creasote may be applied with confident hope.

The combination upon which, however, I usually rely in these cases is a fluid paste composed of acetate of morphia (*five grains*) rubbed up with oil of cloves (*twelve drops*).

It may be regarded that with teeth of this temperament the need for care and skill begins to be more manifest; that the recognition of individual peculiarities will give material aid in the direction of *complete* success (the accomplishment of our purpose without the infliction of, and with the prevention of, suffering), and that the intelligent practitioner can here first have the satisfaction of feeling that his knowledge and skill have undoubtedly contributed their part toward the final result.

Nervo-sanguine.—The signs indicative of this temperament are, more than average size; well built, with marked depth of chest and breadth of shoulders; hair sandy to red, full in quantity and fair in quality; eyebrows light and arched; beard sandy to red, wavy; eyes from light hazel to clear blue, usually larger than average, with expression of much impulse; mouth average, but with a fullness and redness of lips which give it an appearance of more than average size; nose usually shapely and inclined to large; cheeks full and finely florid; skin fair; special senses quite acute, particularly in young and early middle life.

We have here a combination of strong feelings, warm passions, and great ardor, modified by activity and excitability to such extent as to render it a fortunate circumstance, both socially and professionally, that comparatively few such individuals exist. It is in this mid-class temperament, perhaps more than in any other, that we can recognize the value of those influences which are exerted for good in the ternary and quaternary compounds which are the result of bilious and lymphatic admixture with the capabilities of the *nervo-sanguine*. In these we find the beauty of person, the warmth of feeling, the keenness of perception, and the promptness and activity of endeavor, harmoniously blended with the solid, bilious attributes of consistency and endurance, and controlled by the pleasing amount of amiability and gentleness which is appropriated from the lymphatic.

Just in proportion as teeth are *purely* nervo-sanguine in their attributes, so will it be found that difficulty will be encountered in soothing and successfully treating their "almost-exposed pulps"; but, as in the teeth of the nervo-bilious type, it will be quite a rare occurrence that this condition will present for treatment, except in connection with serious general trouble, such, for instance, as after or during protracted seasons of mental aberration, or in consequence of the impossibility of earlier dental attention, or from long-continued treatment for "neuralgia," which had not been traced to the occult cause of an irritated pulp in a perfectly-masked cavity of decay.

When, however, such condition is diagnosed, the most decided pain-obtunding, antiphlogistic and protective treatment, locally, together with prophylactic measures, systemically, must be at once instituted.

These must be continued with persistence, directed by that judgment which can alone be based upon a knowledge of general principles combined with an equally clear appreciation of dental requirements, both therapeutic and manipulative.

I make these observations here in order that it may be the more easy to apply the teachings which, in place, will be given upon this subject. I would mention, also, at this time, that one of the most distinguishing peculiarities of the pulps of the nervo-sanguine teeth is either constant amenability to unremitting treatment or almost equally constant non-amenability to the most judicious, decisive, and protracted treatment which could possibly be employed.

Unlike many other pulps which, yielding to treatment for a time, will then fail of response, and cease further progress toward convalescence; or, again, unlike those which seem, for a certain period, to bid defiance to our best efforts, and then yield a tardy compliance to our desires,—these nervo-sanguine pulps are outspoken for success or for defeat. If they favor success, it then behooves the practitioner to leave nothing undone, *and yet carefully not overdo*, in order that the success they favor shall be accomplished, remembering that with the quick impetuosity, both nervous and circulatory, with which they are endowed, any omission of care, or ill-timed experiment of irritation (manipulative or otherwise), will, most likely, result in relapse, which will prove fatal. If they pronounce against success, their behavior will very promptly compel cessation of conservative treatment, if not actual resort to extraction of the offending teeth, as the absolute requirement of their impulsive possessors.

Sanguo-lymphatic.—Like the bilio-sanguine and the lymphatico-sanguine, the sanguo-lymphatic temperament is the *best of its class*; but its class is one which, dentally, is full of doubt and anxiety. The modification of the lymphatic temperament which is made by the admixture of the sanguine is one which results in an individuality which

is as pleasing, and generally attractive, both mentally and physically, as any other combination. This is not because of exceeding brilliancy, of extraordinary attainments, of classic beauty, nor of enviable social attributes, but rather because of the possession of many desirable qualities, in equally desirable moderation,—a combination which tends toward the prevention of any other than kindly relations between the sanguo-lymphatics and individuals of nearly every other temperament.

The signs of this temperament are, decidedly more than average size; full, round development, in both male and female; hair from dark to light chestnut, straight or wavy, of average quantity, sometimes luxuriant, and of desirable quality; eyebrows dark and not too arching; beard not heavy, brown and soft; mouth large; lips fairly full; nose shapely; cheeks large, full, and nicely tinted, sometimes florid; skin soft, smooth, and white; special senses average.

It will be noticed that this combination in the male would produce, with comeliness of person, the large, well-developed, light-complexioned, kindly-disposed, affable man,—one who would possess fair qualifications in the average walks of life; one who would be a pleasant acquaintance and desirable associate. Without comeliness, one would yet be far from unattractive, and would still possess so many pleasing qualities, that the absence of this one would be constantly overlooked or excused.

In the female, with beauty, this combination produces the full-developed blonde, who is typical of Anglo-Saxon radiance; and, without beauty, still retains to its possessor that contour and general bearing which is redolent of ease, satisfaction, and kind-heartedness.

But this temperament has also its failings: it lacks the quickness of perception which is entailed from the nervous, and the solid strength which would accrue from the bilious temperament. It is for these reasons that it is placed in the list of "doubtful and anxious" temperaments, dentally. It is from these failings that the pulps of the teeth of this temperament are those which, little by little, lose their ability to maintain their integrity under adverse circumstances, and thus, after years of promise (two, three, five, or more), give evidence of this fundamental want of strength by either quietly ceasing to exist, or declaring those symptoms of incurably chronic congestion which compel a treatment that will result in pulp-devitalization.

Bilio-nervous.—In this temperament we shall find a gradual increase of rapidity in physiological and pathological changes, together with a gradual increase of quickness, in response alike to irritation and medication; but we shall also have to note the evident attempt at strength in sustaining existing conditions.

The peculiarities which denote the bilio-nervous type are, less than average size; decidedly less than average osseous, muscular, and con-

tour development; hair of the peculiar range from dark brown (almost black) to dark red (varnished mahogany), and of all grades both in quantity and quality; eyebrows either decidedly arched or almost straight, but usually marked; beard sometimes heavy and sometimes scanty, ranging in color like the hair; eyes less than average size, in color from hazel, or even lighter, to dark brown or almost black, and, whether light or dark, possessing a peculiar twinkling expression when pleased, or an equally peculiar snap when angry; mouth average; lips may be either thin or full; nose generally thin, and either prominent at the "bridge" or pointed and somewhat upturned (*retrousser*); cheeks high-boned and prominent; lower part of face inclined to thin; chin small and round; skin dark and inclined to freckle; special senses quite acute.

The teeth of this type are as variable in size, quality, form, and all other attributes as can well be imagined; and thus we find in one patient of this temperament broad, soft teeth, which decay largely, the pulps of which give little evidence of irritability, or are exceedingly irritable, as the case may be, while perhaps in the next bilio-nervous type which presents one may meet with the long, blue, narrow-necked, long-cusped teeth which respond alike quickly to heat, cold, sweet, sour, and touch.

It is because of this seeming non-reliability as to what may be expected from pulps which sometimes do well, and very well, and sometimes do badly, and very badly, that I have placed the bilio-nervous temperament as a degree more than "anxious and doubtful" in its dental relations. It is always "doubtful," and thus evolves an equal degree of anxiety, whether it eventuates in good or ill.

In the treatment of these "almost-exposed pulps," we have, then, to hope for the best, when no particular hopefulness is any component of pulp-structure.

The modifying association of *strength* has to be carefully aided when it has pronounced favorably, and even more zealously watched, curbed, and countered when it is persistently giving its undesirable help in the direction of sustaining nervous irritability.

The basal attributes of this temperament must be constantly recognized as consisting of keen perception of injury,—thus insuring a full recognition of the abnormality of an approximate exposure upon the part of the pulp; while quick response (as I have stated) alike to irritant and medicament should be as unceasingly kept in remembrance, as the foundation for such treatment as shall insure the least liability for any continuance of external irritation, together with the continued maintenance of such medication as shall prove acceptable alike in its efficiency and in its want of undue power.

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR MEETING, EXTRA SESSION.

MONDAY EVENING, Dec. 20th, 1875.

PRESIDENT NORTHROP called the meeting to order. The reading of the minutes was dispensed with, and the secretary then read the following paper, entitled "Notes from Practice," by W. Geo. Beers, L.D.S., Montreal, Canada:

When, in one of those weak moments which sometimes seize the most cautious of men, I promised to contribute to this meeting, I was more sanguine than now of my ability to face the music of your criticism. I have, indeed, chosen between shirking my duty and hastily running together some notes which may, possibly, provoke enough discussion to conceal their own demerits. I am obliged to put them together like a bad case of irregularity, and tell them in a style akin to the disconnected speech of a patient with cleft palate.

I. *Replantation of Teeth affected with Chronic Periodontitis.*—William Coleman, of London, claims to have introduced this novel operation; though, doubtless, it is as old as Hunter. My experience has been limited to twelve cases. If I were obliged to live the same time over again I should endeavor to limit that experience to one case.

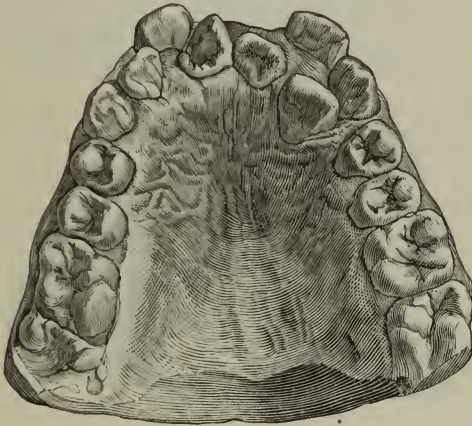
The first case was a lower molar, which, ten days afterwards, I removed with my thumb and forefinger, though it was difficult to extract and almost as difficult to replant. Three others were superior bicuspids, which became loose and troublesome in about three months, and wobbled about in a ridiculous manner, finally literally falling from their places. Two centrals, replanted two years and a month ago, still remain firm, but are endured under protest. Last week I saw two other cases, replanted in January, 1874, which are perfectly solid, though changed to an ugly blue color. Another case seems a success in every respect, except that it notes the changes of weather so perceptibly that the owner calls it his "dental barometer." The others I have not seen since they were replanted.

II. *Excision of Alveolus after Extraction of Teeth.*—In the *Canada Journal of Dental Science* (peace to its ashes!) I described an important case of this kind and the ultimate victory obtained over Nature in modeling into a regular and even arch one of the best imitations of a horse-shoe that I ever saw behind human lips. Since this "heroic treatment" (as such operations have been called) I have made a common practice of removing, with a cutting forceps, large portions of the transverse processes, or septa, and the outer and inner plates of the alveolus, especially where the lip is naturally short, the gums and

alveolus unnaturally prominent, and the prospect is presented that several months' absorption will make the case what otherwise it could not have been,—one suitable for gum teeth. After the extraction of the incisors, cuspids, and bicuspid, cut cleanly across the gum down to the process, as far as you propose to excise; then slip your knife under, and dissect away in one piece. The excision can then be proceeded with, taking care to remove all you cut. I have been surprised to see difficult cases, treated in this way, return in eight or ten weeks with the mouth quite as ready for an impression as it generally is in four months when the alveolus is left to the natural process of absorption. Nothing is done in this operation to *increase* the inflammation which usually ensues after the extraction of teeth. Astringent washes ought always to be used.

III. *One of the quickest Cases of Regulating on Record*, done without plates or ligatures, and comprising ideas as old as Hunter and as modern as Tomes. It is mentioned here more as a novelty than from any desire to recommend its revival. The patient was a healthy young man, about eighteen years old.

FIG. 1.



It will be observed (see Fig. 1) that the normal centrals lie outside their arch, five-eighths of an inch apart; the left lateral is immediately behind the left central, three-eighths of an inch away, with one side against and partly behind the canine, while the right lateral is crowded by the right cuspid and central. On the left side of the median line is implanted a malformed supernumerary lateral; on the right a supernumerary central, of perfect labial formation, but irregularly concave on its lingual side. Its labial surface is turned toward and touching the supernumerary lateral, thus lying obliquely. Evidently these

supernumerary teeth have displaced the normal teeth. In a measure this is analogous to a transposition of the germs of the teeth, or, at least, quite as difficult to treat, as the distance between the normal centers renders it impossible to either coax or force them into agreeable companionship.

I am aware several orthodox modes of treatment might have been suggested by the practitioner who was to receive a large fee, or by those who serve their fellow-man from considerations of love and charity alone; but, as my patient was neither disposed nor able to incur large expense, and was, moreover, on the point of having some of the teeth extracted, I proposed to him the risk of a plan, which he accepted.

First, I extracted the right normal central. Immediately afterward I slowly turned the supernumerary central on its axis, as suggested by Tomes, bringing it to a "front face." Having prepared a plate, I attached floss-silk to the tooth, and drew it back in a day into line with the lateral, painting the gum with aconite and iodine, and instructing the patient to keep lips and gums cool with ice. In two days the tooth was firm, and I removed the ligature. The case then presented the appearance seen in Fig. 2.

FIG. 2.



Tomes (page 197) illustrates a case somewhat similar to that now presented in Fig. 2. In his case the canine occupied the place of the lateral incisor, and *vice versa*, and he says, "In a practical point of view no great interest is attached to this form of irregularity, as it does not admit of remedy." Garretson (page 480) also says, "Instances are met where certain teeth have completely changed position. A lateral incisor appears in the situation of a central, the central occupying the place of the lateral. Here there is no correction possible, except it be in the extraction of the teeth and their rearrangement upon a plate, or through the pivoting process." Salter (page 51),

in writing of the transposition of teeth, supposes a case almost precisely like that shown in Fig. 2, and says, "It may separate the central from the lateral;" and concludes, "Still no treatment is available."

The way I now treated my case was very simple. I extracted the supernumerary lateral on the left side of the median line, and also the left central, of which latter I excised the apex of its root, and pushed it up slowly into the socket of the lateral, fortunately securing the beautiful juxtaposition seen in Fig. 3.

FIG. 3.



The regulation of the cuspid yet remains. The torsion and transplantation were done over two years ago, in presence of my friend and *confrère*, Dr. Brewster. The patient has been frequently seen by each of us since then, and is using the teeth as well as ever before.

I ought to say, in conclusion, that there are constitutional conditions in which one should not venture upon the replantation of teeth with any hope of success.

Dr. L. D. Shepard, of Boston, then read the following paper, entitled "Food in its Relations to the Teeth":

In response to your invitation, I have the honor to present the following remarks upon the above subject.

I have been led to give it renewed thought by a recent case illustrating the effects of proper feeding, and from the conviction that it is a subject second to no other in interest to our profession and to our patients. Also, important as it is in reference to the present, its magnitude awes us when we consider it with relation to the millions yet to come. We must either deny the truth of the testimony of all the most eminent chemical and physiological investigators, or grant that the question of food lies at the foundation of all improvement of the tooth-structure of coming generations.

Men whose lives have been devoted to profound investigations in chemistry and physiology tell us that the various tissues of the body, osseous, nervous, muscular, etc., are compounds of certain elementary substances which cannot exist in the system unless furnished from without; that all life involves chemical action, on which it is dependent; and that every being is, in effect, a chemical laboratory, having inherent powers to select, and forces to resolve and appropriate, the various elements of sustenance and growth, which are forms either simple or compounded in the numerous substances used for alimentation; and that, as no desired chemical combination can be secured (chemical synthesis be effected) unless the necessary elements are present, we cannot obtain normal tissues except by furnishing to them, by one means or another, the chemical constituents found by analysis in such tissue. In other words, while the power to receive and assimilate nutritive substances must exist in sufficient activity to produce such results, the inevitable law remains, that the human laboratory has not power to change the nature of an element, or substitute (except to a limited degree) one element for another, or make any element perform vicarious duty; but must have (with rare exceptions), if it would furnish a certain element to any part, that very element furnished from without, either alone or in combination, as a base or derivative. The scientists further tell us that life and function may continue with an organ or tissue, while that organ or tissue is deficient in normal constituents; but that, while in such condition, it cannot fully perform its duties in rebuilding its wasted substance; and that thus activity is lessened and life abbreviated.

The above general principles we must accept as truths, from the nature and modes of their establishment. Some of them appeal directly to our convictions as self-evident.

There are other, more particular, principles, which we also accept, in regard to teeth; viz., that they are very largely mineral in their composition, being mainly formed of the phosphates and carbonates of lime and magnesia; and that their indifference to attacks of destructive forces is largely proportional to the percentage of their mineral constituents. The proof of the last proposition is found in the fact (universally observed and admitted by dentists) that susceptibility to caries is greatly diminished in middle and advanced life; periods in which the teeth, in common with the other osseous structures, have become very dense, or contain a larger proportion of mineral constituents than in earlier life.

I am not unmindful of other safeguards from decay of the teeth than richness in phosphates; nor do I forget the multitude of reasons given for their decay or non-decay. We are all familiar with the numerous theories,—as to the use of candy, of mercury and other medicaments,

uncleanliness, indigestion, crowding, acids, soft pabulum, etc. Granting to all these their just force, we shall find that, in a given thousand of cases, the five hundred having teeth poor in phosphates will present a much larger average of decay than the five hundred richer in such materials. If this be true, is it not important to keep the teeth well supplied with phosphates?

It is generally said, and believed, that the teeth of the present are not so good as those of the past. The data for establishing this belief as a truth are very meager; and it is unfortunate that they are so. Before the advent of our profession (which dates back but little more than a generation), little attention appears to have been paid to the teeth, or their diseases and treatment. But surely, our ancestors suffered from the toothache, knew the terrors of alveolar abscess, and lost their teeth. From what little testimony we are able to gather on the subject, and from the important fact that saving of diseased teeth was then unattempted, and even unknown, I think there can be little doubt that our ancestors possessed better teeth than their descendants.*

The importance, to us, of the conditions of old-time teeth lies in the inferences we are to draw from concomitant information as to the effects of our ancestors' style of living, when contrasted with ours, on the formation and renewal of tooth-structure. It is certain that they used very different food from ourselves; and it appears to be equally certain (if we are to believe scientists) that their food was of the kinds from which good tooth-structure is developed. Consequently, could the fact be established that their teeth were better than ours, it would form a powerful argument in favor of my position.

To return to the authorities,—we are told that certain grains, and certain parts of the grain, are rich in phosphates, while others are not so. Oatmeal is said to hold a high rank as bone-food, and *whole* wheat a still higher; while our very white, superfine flour is almost wholly wanting in such material.

I have long been convinced of the truth of these statements, and have talked much to my patients, especially to mothers, upon the importance of proper diet, in order to lessen the future needs for dental operations. I can hardly imagine much good to have resulted from these conversations; yet I see in this our greatest field for the conferring of benefit to our race.

Most of the preparations recommended are objectionable, from one or another reason. "Graham flour" is not generally palatable, and is irritating to the intestinal walls, the coarse bran being cast off entirely

* In my opinion, most of the edentulous mouths among our ancestors were caused by want of cleanliness; sound teeth dropping from the resulting diseased gums.

unassimilated. Oatmeal savors, to many, of medicine, and needs special preparation. I think the flour once made, before the introduction of most of the present "great improvements" in flouring-mills, was preferable to that which we now procure. The bread made therefrom was somewhat dark-colored, had a sweet taste, and was tougher to mastication. My older friends here will remember it, especially those brought up in the country, where its use was continued long after it was discarded in cities. The rage for *white* flour, however, has driven it from the market.

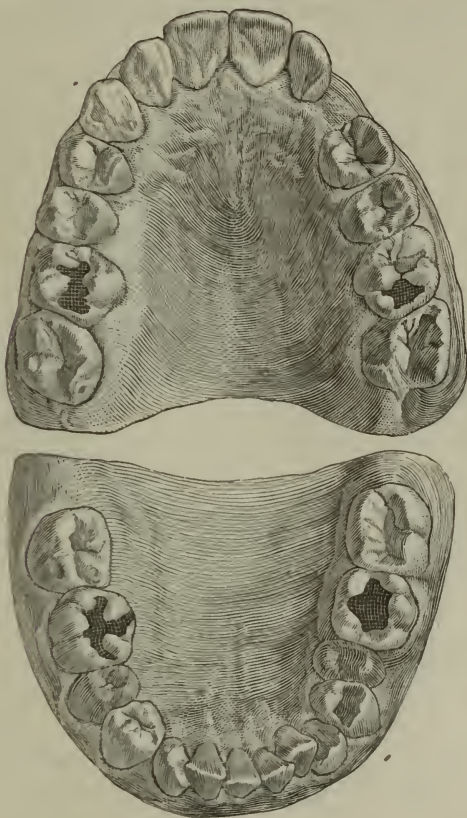
On my return from vacation, in September last, my grocer called my attention to a new wheat flour, which I have been using ever since, and consider the "right thing." It is quite fine, without any coarse pieces of hull; and the manufacturers describe it as made from the whole grain of wheat, containing all the mineral constituents of the grain; and therefore proper food for osseous, nervous, and muscular tissue. This flour is the product of the "Cold-Air Attrition Mills," of Chicago, Illinois. It is claimed that by this process (which is new; no millstones being used) there is no heating of the grain while in preparation. I do not pretend to know what is the value of this abolition of heat during disintegration, or to what extent the claim is an advertisement. The greatest claim of the flour upon our recognition is, that it contains all the constituents of the grain. It requires manipulation at the hands of the cook somewhat different from that of ordinary flour; but a few trials should make success certain. My family like it very much, and the use of the ordinary flour with us has, in consequence, almost entirely ceased.

In particular and striking illustration of the relations of food to the teeth, I have the pleasure of presenting before you models of a mouth in which I have seen the effects of a change of diet. This case has, twice before, been presented to this society. Some of you may remember that, in May, 1872, at a meeting in the house of Dr. Lord, Dr. Arthur being the essayist, I exhibited this model (Fig. 1), gave my reasons for the extraction, two months previously, of the four sixth-year molars, and stated what I expected would be the result. These four teeth were badly decayed, but could, undoubtedly, have been saved for years by extensive and repeated operations. The pulp of one was exposed. The two lower second bicuspid were prevented erupting by the crowded condition of the teeth. There was also but one-half the necessary space for the left upper cuspid, whose predecessor had just been extracted. All the teeth were *very soft*; and were so crowded, and had so many proximal cavities of decay, that I considered the only chance of saving the remaining teeth to be the obtaining of more space by the loss of four teeth. In the course of the criticism of my

procedure, one gentleman, in his enthusiasm for saving all the teeth, informed me that I should "live to be ashamed of this mouth."

At a meeting at Dr. Clowes's house, in February, 1873, I read a paper, as the essayist of the evening, on the treatment of the sixth-year molars, wherein I made the statement that "the law is, that the tendency of the bicuspidis is, whether the teeth are crowded or not, to fall back upon the extraction of these four molars at the proper time;" this being the opposite of Dr. Arthur's assertion. In proof of this I showed many models of the condition of mouths before and after

FIG. 1.*



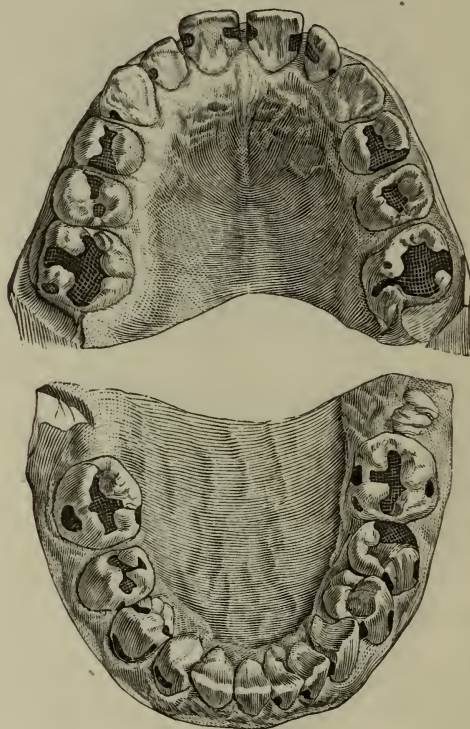
extraction; among them the original model (Fig. 1) of this case, and another, of the same case, made one year after extraction of the four molars. The latter model showed that the teeth had so changed posi-

* In this illustration no attempt has been made to indicate the places of decay or of fillings, except in the four molar teeth which were to be extracted.

tion that spaces could be seen even between the central incisors ; that the very irregular position of the lower incisors and cuspids had been corrected by nature, without any aiding appliance ; and that the second lower bicuspid had come up into position. That model I have not brought with me, as the changes named can be equally well seen in the model (Fig. 2) which I have just made.

I ask you to notice all the above points upon the models shown. They are necessary to a complete understanding of this case, though not bearing directly upon the question of food. The patient was born November 10th, 1858, thus being fourteen years and four months of age at the time of extraction of the molars. He is now seventeen years old, is nearly six feet in height, and has been growing very

FIG. 2.



rapidly. He has been under my care about ten years, I having extracted some of his deciduous teeth. He has been seen by me, with some regularity, during all that time.

As soon as the permanent teeth erupted they required filling ; some of the bicuspid and molars being filled when only the grinding surfaces were through the gum ; soon, however, the filled teeth required

refilling. You will notice fillings in the four extracted molars, showing that the attempt was made for years to save all the teeth. Indeed, it was not until the impossibility of the proper eruption of the second lower bicuspid without more space became apparent, and the occurrence of fresh places of decay in the buccal, palatal, and lingual surfaces of the four molars, that I decided upon their extraction.

The teeth were so deficient in calcareous salts that I could give the parents no encouragement as to their permanent salvage. I was, however, instructed to do the best I could, with the hope of ultimately saving some of them.

About five years ago, on my advice, the patient began to use oatmeal in addition to the regular mixed diet found on all tables. From that time to the present hardly a day has passed without the consumption by him of a saucer of oatmeal twice daily. He has adhered to this diet, as his parents inform me, with most conscientious fidelity.

In the mean time I had, in this case, almost wholly discarded gold as a filling material,—to save expense and the cutting away of much sound tooth-structure to form proper cavities for its retention, and, especially, because it had proved but a temporary filling,—and substituted temporary materials, principally oxychloride of zinc, generally Guillois's cement, also Hill's stopping, tin, and amalgam. I had noticed a gradual improvement in the texture of the teeth, but had not given much attention to it, as I had cut as little as possible in replacing the temporary fillings, and there had seemed to be no reason for changing the plan adopted. But, last May, not having seen him for eight months previously, in replacing some temporary fillings I discovered that his teeth had so changed that they were as hard and dense as those of a man in middle life. The instruments cut with difficulty, and gave out the peculiar sharp, high tone so familiar to us as indicative of well-formed dentine. I then decided to change the plan, by replacing the temporary fillings when they came out with gold.

During the autumn, however, circumstances rendered it necessary for him to be absent from the vicinity for a considerable time, and it was accordingly determined to at once remove all temporary fillings and refill with gold.

In sixteen sittings which I have given him since last May, I have refilled with gold nearly all the old cavities, which, with some few small, new places, made the large number of forty-two gold fillings. To these must be added such gold fillings as had been put in previously and had remained good. I have marked them upon the model, and they sum up fifty-five separate fillings, simple and compound.

I have tabulated from my records all the fillings since 1868, and will give here the result with the six proximate surfaces between the four upper incisors.

In the mesial surface of the right lateral there were: Gold, November, 1868; March, 1870. Oxychloride of zinc, May, 1872; November, 1872. Gold, September, 1875.

In the distal surface of the right central: Gold, March, 1869; October, 1870. Oxychloride, May, 1872; November, 1872. Gold, September, 1875.

In the mesial surfaces of the right and left centrals: Two gold, February, 1869. Two oxychloride, May, 1872; November, 1872; October, 1874. Two gold, September, 1875.

In the mesial surface of the left lateral and distal surface of the left central: Two gold, November, 1868; December, 1869. Two oxychloride, October, 1874. Two gold, September, 1875.

Summing up my whole tabulations, I find: In 1868, three gold; in 1869, sixteen gold, five oxychloride; in 1870, three gold, three oxychloride; in 1871, three gold, five oxychloride; in 1872, nine gold, nineteen oxychloride, five tin, three Hill's stopping; in 1873, two gold, three amalgam; in 1874, two gold, fourteen oxychloride, one Hill's stopping; and, in 1875, forty-two gold fillings in fifty-five original cavities.*

To prove the truth of my position with regard to the influence of diet on this case, there is still wanting the test of *time*. On this I will, if possible, report to you in coming years. I may say that I believe the percentage of failures in the fifty-five fillings will be small; and further, I have no doubt that the result of this case, so strange and complete, is, in the main, the direct result of long-continued, correct dieting. Other causes have, doubtless, contributed their quota to the general result, but, in my opinion, they must occupy "second place." The patient's general health has undergone no improvement, so far as I can judge. He has taken only such care of his teeth as boys can generally be induced to take. Equal improvement has taken place in all the teeth, whether filled with gold, tin, gutta-percha, amalgam, or oxychloride of zinc. The improvement has been from within, and consists in the large addition of lime to the tooth-structure. I must also add my firm conviction that, next to diet, credit must be given to the wise extraction of the four molars. I do not believe that I could show you to-day or next year twenty-eight well-occluding, *living* teeth had I retained the four molars in their places.

* The four molars were extracted in 1872. In twenty-eight sittings previous to 1875 there were 96 fillings; in sixteen sittings in 1875 there were 55 simple, or 42 compound, fillings. Of the 22 proximal surfaces of the upper teeth, there are only 5 not filled; of the same of the lower teeth, only 4 are not filled. I have not counted the four distal surfaces of the four second molars. All the pulps are alive, and the four wisdom-teeth are coming with plenty of room.

In my opinion we need but few such cases as the above to establish the position, that proper feeding is the great prophylactic against caries.

Dr. Nathaniel W. Hawes, of Boston, then read the following paper, entitled "Sixth-Year Molars :—"

Agreeably to the invitation of your committee to be present at this meeting and read a paper, I wrote them that I could not bring a paper, but that I might concoct a "squib," and am here to fulfill my communication in both respects. I know very well that the subject I shall introduce is a trite one in your discussions, and whatever views I may entertain in the matter of six-year-old molars will meet with decided opposition. Primitively, we are apt to take the *ipse dixit* of our instructors, and treasure it by rote, if not by instillation, as an axiom *per se* sufficient for all time; and our predecessors may have done the same thing, so that there are so-called axioms in our specialty that have been inherited; and what we have inherited we sometimes consider constitutional, and, like an entailed estate, we never question the possessed papers or search the records, and go on lymphatically drawing the simple interest regardless of the principal. John Stuart Mill says, "A great part of our lives is occupied in doing something or other that is purely useless, because our remote ancestors did the same thing when it had some real use."

But the despotism of custom is on the wane. We are not content to know that things *are*; we ask whether they *ought to be*. I have no positive rule about the six-year-old molar teeth, but would make saving them general, and extraction of them exceptional. I deprecate the general extraction of these teeth. I was not so taught. A common expression among the dentists in New York, where I pursued my early studies, was to this effect,—that "the highest calling of the dentist was to save the natural teeth." And I was much surprised, after settling in Boston, to find so general an impression entertained there among the best operators, that the extirpation of the six-year-old molars was a primary necessity on reception of a young patient; one of our oldest dentists going so far as to express the regret that he had ever allowed a six-year-old molar to leave his office in the mouth of his patient,—a rule of practice which surprised me exceedingly, as in contradistinction to my earlier instruction. For a time I entertained the idea that this was a Boston provincialism, until a prominent dentist outside of New England comes forward and tells us that the six-year-old molars have "ceased to belong to the permanent set of teeth"! When did they cease to belong to the permanent set? By what authority does he speak? I fear that, like St. Paul, he "said these things without command." Our text-books, and also the profession generally, certainly speak of them as permanent teeth. Now, if they

are permanent teeth, why should they be treated as deciduous organs? Or is the name *permanent* a misnomer? Or were they early designed as permanent by the Creator, and has it fallen to the modern dentist to show the fallacy of such primordial plans?

We are told by Darwin that the future human mouth will be toothless like the turtle. Is it the province of the dentist to hasten the coming of that toothless day?

It is claimed by some, for whose general opinion upon subjects in relation to our profession I entertain the highest respect, that it is necessary to thin out the teeth in order to give those remaining a better chance for development. This thinning-out process may be proper for the gardener to follow in his carrot-bed; but, methinks, for the dentist to thin out the teeth on general principles is a bad practice. In ordinary mechanics, we know that if a fraction of the arch be displaced, the whole structure is weakened in proportion to the amount of displaced material; so, also, the teeth depend upon each other for assistance and lateral support in mastication. Again, we have all observed the weakened masticating power in edentulous subjects; and so must the power be lost in proportion to the part gone that helped make the whole. But, then, suppose we do extract these teeth, what of it? It is an easy way to rid ourselves of laborious operations in filling them if they are badly decayed; and, as dead men tell no tales, we do not hazard our reputations in our efforts to save where we neglect to protect ourselves by a few moments' instruction to the parents or guardians. I am happy to say that I can show several mouths wherein I have saved the six-year molars even when the pulps were exposed, and they are doing good service to-day. I believe a secondary deposit can be stimulated with more safety in the young than in the mature subject; and if a six-year-old molar can be saved with an exposed pulp, it is certainly our duty to make the effort with those less diseased; for our duty lies not wholly with the present generation.

Again, the extraction of these teeth is often an easy way to assist in remedying an irregularity; but I do believe these teeth are sacrificed for this purpose too often, and if dentists were blessed with a little more patience and knowledge of methods of procedure it would not be so. It can be shown that these teeth have more often been extracted through ignorance than from the intractable nature of the irregularity. However, it is said if the six-year-old molars be extracted at the proper time, *i.e.*, when the child is about eleven years of age, the twelve-year-old molars will fill their places, and they will never be missed by the common observer; that is to say, missed by those who know but little about the teeth. Oh, no! ignorance will not miss these teeth; but how about Nature? Can you cheat her? Will she not feel the loss by being deprived of fifty per cent. of masticating surface for a year

or more, thirty-three per cent. until maturity, and twenty per cent. through life? Why, from a purely mercenary point of view, the twenty-five per cent. more time spent in properly masticating our food, should that time be applied to any ordinary business, would amount to a snug little fortune if the possessor should attain to threescore years and ten. And this lost fortune is also much increased through such extraction among our food-bolting Americans, by inviting, at the first office of digestion, indigestion and dyspepsia and all their concomitant ills. But perhaps I omit the great object of this thinning-out process, to wit, the prevention of decay by lessening approximal friction and interstitial deposits. Now, where are our fathers in surgery that they have not caught light from this discovered error in creation and commenced a thinning-out process of the muscles in general to allay friction, prevent waste, etc.? To be sure it would weaken the muscular power of the body, but the vital fluid would have less to nourish, and the absorbents less labor to perform. Then we should have a healthier body and a richer vitality, *only lessened in power*.

"Beautiful theory," as Mark Twain said of his story, only he "was so bothered with facts!" Let us away with such sophistry, and ask ourselves what will be the effect upon future generations if we continue extracting the six-year-old molars. Has it not been done now until we have a contracted jaw by inheritance, thus giving the patrons of this theory some apparently tangible ground as a base? Will not a continuance of this extirpatory process after a time obliterate the six-year-old molars, the future dentist pursuing the same theory with the twelve-year-old molars, then the wisdom-teeth, next the bicuspid, and so on, until none but the labial organs remain? And the mission of the then practicing dentist, with the physiognomy of the rodent, his practice limited to these latter organs, will soon be fulfilled. Thus the Darwinian theory regarding turtle-billed humanity will have sung the last requiem of Morrison engines, rubber dam, forceps, and the like, and its supporter will feel that he is one more step removed from his progenitor, the monkey,—who can still show its ivory in grinning silence at the wider breach between it and man,—and will, perhaps, by that time have traced his origin to the pig, and from the pig to the grasshopper.

Discussion.

Dr. Flagg, of Philadelphia. I believe it to be an unquestionable fact that, under the present régime, teeth are deteriorating markedly. I have been in practice some thirty years, and have operated upon the teeth of children whose mothers and fathers were children under my care, and brought to me by their mothers and fathers in turn; and I have seen, during generations thus passing before me, a marked deterioration in the teeth.

I have "talked food" for many years, and heard the doctrine advocated as long ago as I can remember. We cannot stand, however, against the current of tendency toward luxurious living which exists in this country. It seems to me useless to talk of food in a general way. Where you can get one individual to do as Dr. Shepard's patient did, there are hundreds who will not do so.

I have now in my mind's eye a case illustrative of Dr. Shepard's position,—a patient with whom I began when he was a boy, eighteen years ago, and when his teeth were not worth a rush. In a lower sixth-year molar, a mere shell, I put a filling of Sorel cement,—some of the first that came to this country. That filling has stood for eighteen years.

Now, gold failed in that mouth just as fast as in the case cited by Dr. Shepard. I tried gutta-percha, amalgam, oxychloride of zinc,—all sorts of things; but it was of no use. All these things failed, and the fillings had to be removed.

About six or eight years ago this young gentleman, impressed by what I had said to him, began the use of oatmeal, cracked wheat, and other such preparations; and to-day I think Dr. Shepard could introduce gold fillings that would be permanent in that mouth. The teeth have entirely changed their character. They respond to the cutting instrument just as good, hard tooth-structure responds. I have not removed the fillings in his mouth and replaced them with gold, simply because they seem to be doing very well. In fact, gentlemen, I have arrived at that point in my professional practice where I can "let well enough alone."

I mention this case as a marked illustration of the influence of long-continued diet upon tooth-structure. But we have, in antagonism to this, hundreds of cases that have done the same thing without special feeding. That is where we stand, and it is a slippery pinnacle.

The first thing to consider, as to the present deterioration of teeth, is how it is being brought about. It is not only because bread is made so white.

What is the time at which teeth decay? Is it after breakfast, between breakfast and noon, when all the interstices are cleaned by having new food introduced in the morning, and when the fluids of the mouth are changed by the action of the salivary glands excited by mastication? This food cannot have time to putresce between breakfast and dinner.

If anybody has money enough to get a good lunch, he gets food enough at noon to fill all the interstices of the teeth, and thus the food introduced in the morning is cleaned out in lunch-mastication, and anything left there then has not time to putresce before supper-time.

The average American has a hearty supper, because he doesn't have time to do himself justice in the middle of the day. He has the biggest strawberries, the youngest chickens, the tenderest corn, the finest beef-

steak,—everything he can wish. Now, it is these things which he takes at supper that do the mischief. And the wise dentist will recommend his patients to give the teeth a good brushing before going to bed. Most patients do this in the morning, just as though their breakfast did not do it. It is between supper-time and five or six o'clock in the morning, if the teeth are not previously properly brushed and attended to, that the secretions become insipid and that peculiar change indicated by a disagreeable taste in the mouth takes place. We do not experience that bad taste at any other time.

I have been trying to correct these evils in a practical way. I have recommended my patients to eat all the food they desire, and to brush their teeth, not as usual on the front faces and irritating the gums, but with a little *castile soap* on the *articulating faces*. What they want is lather. That is what stops the growth of those little pollywogs of which the professor spoke in his paper. I go on from castile soap to carbolic soap, and when you have reached that point you have reached a potent aid in the matter. I have patients who, without a single other aid, have during the past seven years, through the use of carbolic-acid soap on the articulating faces of their teeth, brought about a condition of things exactly analogous to that described in Professor Shepard's paper. I have fillings in teeth (which have been in three years) which you could not by any other method of treatment have kept in for eighteen months. I make that assertion, because I see before me gentlemen, eminent fillers of teeth, with whom I have competed by this method. Their fillings lasted just as long as mine, and no longer; and they tried their level best, while I did my level worst, because I thought the teeth were not worth the trouble of great nicety in fillings. These teeth have been very durable, all tenderness gone, and perfectly free from irritation.

Again, I recommend the patient, before going to bed, to put a little chalk in the mouth and rub it around the interstices of the teeth; it will work wonders. A very small quantity rubbed into the interstices of the lower teeth will neutralize the fluids of the mouth, and will show itself in six months to be a valuable agent in promoting a healthy condition of the teeth and gums. It will bring about a change as great as that spoken of by Professor Shepard. It changes, indirectly, every tissue in the body, by enabling the patient to masticate food thoroughly and thus aid the processes of digestion.

Dr Peirce, of Philadelphia. I feel that Dr. Flagg has hit the nail on the head in his remarks on cleaning the teeth at night. I have for the last seven years recommended all my patients to keep a box of chalk in their chambers, and rub a portion into the interstices of the teeth and on the gums before going to bed. In such cases I have seen a marked improvement in the condition of the teeth. They have grown more dense, and also less sensitive and irritable.

In reference to the salvation of the sixth-year molars, I heartily indorse Dr. Hawes's paper. I think dentists generally are too reckless in the destruction of those teeth. Their importance to the patient is very great, and I consequently make it a rule to save them, if possible, even if I can save only the roots with a portion of the crown, or with only a plastic filling. I think such a course should be followed in all cases, except where they occupy space absolutely essential for the development of the other teeth.

Dr. Atkinson, of New York. Lest the first paper should be entirely unutilized, I wish to call attention to the manner of removal of the transverse processes and the posterior and anterior plates of the processes, for securing a good arch for artificial teeth. The surgical law involved in the removal of teeth is the taking away of these points, toward which circulation tends,—all that portion which surgeons call “variable part of the jaw,” are the parts which absorb. It is much the best to remove them surgically. I was criticised twenty years ago for advocating that practice. The mode is very simple. Every dentist can do it. After removing all the portions you wish to, in as delicate a manner as possible, lay the flaps of the gums together, cut off the excess so that the margins of the gum will simply coaptate without undue pressure, and then with a fold of any thin cloth, cotton or linen, saturated with tannin and glycerin, lay it together; then put enough bibulous paper between the jaws to make a cushion, and let the patient close the mouth gently, when agglutination will take place without any stitching. Thus the whole process is simple coaptation, obtaining union by first intention, which, I wish to state, is always an act prior to what is called “cohesive inflammation,”—which I call “adhesive nonsense.”

Prof. McQuillen, of Philadelphia. The subject presented by Professor Shepard is to all of us an interesting theme, one on which much of our professional usefulness depends. Upon its proper appreciation hangs almost all our knowledge, not merely of the nourishment of the teeth, but of every tissue and organ in the body. But it appears to me that our profession is inclined to take a somewhat one-sided view of the necessity for introducing phosphates and phosphatic food into the system. Is there nothing but phosphatic substance entering into the composition of the teeth? True, tooth-structure is mainly composed of mineral constituents, but there is also an animal basis of gelatin. There are in the organism certain organic principles. These principles constitute the basis of the tissues, and it must necessarily follow, for the proper nourishment of the organism, that each of these principles should be present in the food; therefore the diet should be mixed. If this be true, then, the introduction of phosphates is not alone sufficient for proper nourishment, either of tooth-structure or any other of the tissues.

No one can recognize more fully than I the importance of the various vegetable preparations named to us in the paper just read. But analysis shows that phosphates are present in animal as well as in vegetable food.

When examining decaying teeth, do we always find the mineral part alone breaking down? Do we not find frequently a softened condition of the structure, and, on removing it, obtain only a certain amount of the gelatinous basis of the tooth? And, under other circumstances, do we not find the tooth crumbling and chalky, as though it was merely lime? In the former case the teeth need the introduction of phosphates; in the latter, something to supply the lacking gelatinous basis.

A distinguished writer (no less an one than Lionel S. Beale) asserted some years ago that hard structures (bone and teeth) once formed never undergo change. This view has been taken up and reiterated over and over again. As ample refutation, however, it is sufficient to direct attention to the deciduous teeth as being perfect in formation when examined with the microscope. Yet we know that their hard structure, in due course of time, by a process of retrograde metamorphosis, is removed cell by cell as it was built up. If this law is true of the deciduous teeth, is it not equally true of the permanent teeth? Are we, then, to accept the position that after having obtained their full growth they remain unchanged? I think the experience of the gentlemen around me is to the contrary.

Therefore, while I advocate the use of the vegetable food named, I desire that other portions of the organism than those nourished by phosphates should be borne in mind. We should remember that the dentine is made up of an animal basis in which, by a peculiar physiological action in nutrition, phosphate and carbonate of lime are combined with the cells, thus becoming part of the organ, and hence it is necessary to introduce different kinds of food with which to meet *all* the demands of the organ. Each tissue and each organ acts as an excretory organ, drawing to itself the materials essential to its nourishment and rejecting what is not essential.

As Dr. Flagg has said, we are too much governed by our palates. Through the influence of the unwholesome foods dictated by our tastes, the organism becomes deranged and the tissues improperly nourished. The almost universal insufficient mastication—even bolting—of our food is a great source of evil. When the teeth are properly used, especially in the earlier periods of life, there ensues a well-developed jaw and an organism in proper tone, because the stomach is not overtaxed. It has been said that our ancestors had better teeth than we have. I am skeptical on that point; but if it is so, I think it may be concluded that the conditions under which they lived were such as to insure the best general organic (and therefore tooth-structural) development.

Prof. Coy, of Baltimore. In practice I do not think it makes much difference whether we use oatmeal, potatoes, or beef, provided what we do eat is properly assimilated. As a general thing, in a normal condition of the stomach, that which the appetite craves is that which will be the most easily and completely assimilated, and consequently will be the best for the system. I believe in allowing the palate to dictate what we shall eat. I believe that if a particle of food be swallowed that is obnoxious to the palate, it will not be properly assimilated. One reason for this is that, being obnoxious, we do not properly masticate it.

Prof. Hamilton, of New York. The subject of destruction of the teeth by material eaten has, of late, been much discussed by medical men, and especially by dentists. During the discussion Dr. Johnson's definition of *oats*, in the large edition of his dictionary, occurred to me: it was, "A grain which in Scotland is given to men, but in England to horses." Some one, in commenting upon this, asked, "Where will you find finer men than in Scotland, or finer horses than in England?" Whether it is the oats which make English horses so fine and Scotchmen so vigorous is, in effect, as I understand it, the question now under discussion.

I think medical men generally take somewhat the view of the gentleman from Baltimore. We must consider, not so much the quantity of the food taken, as the ability to assimilate it properly. If the food is not supplied with the necessary elements for tooth-structure, they will not be imparted to the teeth. But the human system is not a crucible or a barometer. We cannot make a general rule that we can add to the organism a certain amount of phosphates by putting a certain amount into the mouth. The amount of phosphates to be used by the system will depend mainly on the digestion. As an illustration, you are aware that stomatitis is the main source of that early and peculiar decay of the teeth seen in hereditary syphilis; and it is not so much the hereditary syphilis which causes the impaired digestion as it is the imperfect condition of the teeth which accompanies this disease. I think that is in accordance with the views of medical men generally.

But you, as a profession, are advancing so rapidly, and make so much curious and new observation, which in the end proves to be correct, that I state these views with some degree of hesitation. It is possible that the idea that we should eat food which contains material for the nutrition of the teeth is of more importance than I had supposed.

Dr. J. Marion Sims, of New York. The first paper read struck me with much force, and reminded me of a fact that may be of interest to you. In 1825 there lived in Lancaster, South Carolina, a medical surgeon named Jones. His wife, a beautiful woman of about thirty years of age, had lost one of her front teeth, and he got a tooth from one of

his servants and transplanted it to the mouth of his wife. The writer of the paper we have heard, stated that he could not justify the operation from his experience. But in this instance the tooth was a good tooth for more than ten years,—from 1825 to 1840,—and was useful for two or three years more. As the lady grew old, and her other teeth decayed, this tooth also decayed; and I saw it, after its extraction, when it had been useful to her for at least fifteen years.

As to the effects of diseased teeth upon the general health, I wish medical men generally could be better educated upon that point. We are all familiar with the fact that decayed teeth frequently cause neuralgia; and this is the extent of medical information on the point. They usually do not recognize the fact that, as a general thing, decayed teeth, teeth with inflamed alveolus, with matter exuding from around the teeth, are the means of producing more nervous disorders, more terrible consequences to the general health, than almost any other thing that can happen.

To illustrate: last Monday a lady, seemingly about fifty years old, came into my office with some pictures for sale. She looked hearty, red, and plump. She said, "Doctor, do you remember me?" I answered that I did not. She said, "I am Mrs. Smith, and I was in the Woman's Hospital in 1856." I then remembered her. She was sent there by a celebrated physician of this city, who said she had a fibrous tumor of the uterus. Her eyes were veiled from the light, and she was in an exceedingly nervous condition. I examined her tumor, and decided that it had no influence on her general health. I examined her system generally, and ascertained that it was not poisoned by coffee, tea, or stimulants. I then examined her mouth, and found she had not a sound tooth in her head. Every one was diseased about the roots, exuding matter, and there were many little alveolar abscesses formed. I declared that the necessary curative process would be the extraction of her teeth. The doctor was surprised, and wanted me to do something for her tumor. I declined, and she finally consented to have her teeth out. I then sent her to some skillful man, who furnished her with a good set of teeth, and she was soon well.

I was in Louisville last May, and a doctor, knowing I was to be there, brought his wife from Texas in order to consult me as to her health. She was in a much broken-down condition, but her symptoms appeared too pronounced to be produced by any disturbance of the female physical functions, and I found that there was no disease of the uterus. But her teeth were very bad: nineteen or twenty of them decayed, some even with the gums; all badly inflamed; and matter exuding to poison the nervous system. I told the doctor to go home, pull out all her teeth, and give her a new set; and I afterward had the satisfaction of hearing that, through such a course, her health was fully established.

Such cases I could narrate by the hour,—I cannot tell how many such, in which some simple knowledge of this subject would enable the medical man to treat them more successfully than he does. It is a matter of regret that medical men generally have so little knowledge of this subject.

Dr. Dwinelle, of New York. The paper of Dr. Shepard is certainly one of great importance. I do not agree with those who recommend the indiscriminate extraction of the sixth-year molars. I do not believe they are guilty things, out of place in the order of nature, and to be removed as soon as possible. I have faith in God and his wisdom, and believe he knew what he was about when he created those teeth as well as the rest. I believe the only *general rule* to be observed on the subject is to preserve as long as possible the order prescribed by nature; and, under all circumstances, in each case to follow the dictates of our conscience, experience, and judgment, not attempting to form arbitrary rules which must be observed in all cases.

In reference to food, I would say that as general truth is to be found in a golden mean between extremes, so it appears to be when considering this subject. I do not doubt that the normal cravings of nature are often a proper guide to the selection of food; nor that assimilation is very important in the elimination of nutrition for the system from the food. But I also think that animal chemistry should come in to modify the whole; for, no matter how much power of assimilation we may have, if the proper elements, organic and inorganic, be not supplied, the tissues will not be properly nourished, and the assimilation goes for little or nothing. If the carbonates and phosphates be not present, no function of assimilation can supply or appropriate them to the system which may be wasting and impoverishing for their need.

Adjourned to nine o'clock Tuesday morning.

TUESDAY MORNING, Dec. 21st.

The meeting was called to order at nine o'clock, President Northrop in the chair.

Dr. C. N. Peirce, of Philadelphia, read a paper entitled "Facial Neuralgia."*

Discussion.

Dr. Atkinson. However much we may know inspirationally under the stress of our desire to do good to our patients, in the end the ordinary influences that inform the human understanding must mainly awaken the aspiration, as well as the ability, to be efficient for every professional purpose. We are not competent to formulate such inspira-

* This paper was published in the DENTAL COSMOS, February, 1876.

tions and carry them with us without going through just the course indicated by Dr. Peirce.

Asserting that the molecules are killed by the application of cold is erroneous. If they were killed, that would be the end of them. They would not be wrought into tissue. They are merely arrested in their development. There is a winter comes over them. During this time of slumber the molecular motion enables them to supply amœboid movement, which is the foundation of all function; it is the basis of all our apprehension, and the point of inception of not only pathological but physiological activity. I want you to remember that pathological action is not death in the line of Dr. Peirce's argument.

The great problem of our profession is how to diagnose derangements of the trifacial nerve. Why that more than others? Because its operations are occult. It reaches back not only into the protoplasm, into the juices of the flesh, in which the preparation of the food is completed, and where it is held in reserve to be applied through these amœboid agencies to the various tissues of the system. Why do we know so little of the nervous system? Because it is the first remove from the protoplasmic mass, the resultant of the food we take. It is by the differentiation of this protoplasmic mass that the tissues are formulated so that we are able to observe some of its appearances. Why are we not able to follow the circuit of these irregular nervous movements which we call neuralgia? The reason is, not that there is not a sufficient cause behind, but that our observations are not fine enough to catch the difference between the normal and abnormal workings of these currents.

One thing further,—one further criticism. He said there were nodules of dentine. I don't like the term *dentine* very much. It is one of those embryonic expressions which are the stepping-stones to correct apprehension. It is in no proper sense *dentine*. It is a calcified point of the pabulum *outside the pulp*, which is the cause of its being remanded back to the law of crystals. Mechanically arranging tissues around the territory under the operation of the cellular or vegetable movements is merely from mechanical pressure exerted by it, and not, as I am sorry to hear my friend say, from irritation of the calcified edges of a growing tooth. The beautiful territory toward which he has taken us ought to occupy the whole session of this body; even this one aspect of the paper. In the first place, there are what are called dentinoblasts, which constitute the receptacles of the lime-salts, being the calcified portion of the dentine or tooth. This calcification is most pronounced at the point where the cell is attached to the already hardened substance, and it becomes softer and softer until it gets to the entire end of that cell or series of cells in which they are shaped. Some of them are not capable of holding, and do not hold, any lime; they are in a state of

complete solution, and, consequently, complete plasticity, and could not produce any irritation but the irritation of kindly influences working together for a common end.

There is no such thing in nature as pushed back and reflected mechanical pressure. I grant you may have irritation from solution. But this is not solution. It is physiological. If not physiological, then positively the very slightest degree of pathological activity. So that we do get a point at which every act must have a mechanical expression, and that is what entrapped Professor Peirce and others into allowing themselves to fail to make a complete solution of the difficulty.

He said that the third molar was impacted between the angle and the ramus of the jaw. Every single tooth must be impacted in the jaw. Impaction is inadmissible. There can be no absorption of the ramus according to the law of morphology. It is by increment; by excretion of the very fine fluids of the capillaries, containing lime-salts, which are seized and handled by the osteoblasts, and thus calcification is allowed to take place. There is no resorption of anything laid down except the natural physiological resorption which results from completed growth and use of a cell, as in the roots of the deciduous teeth. There is resorption, because this is the provision made for the removal of the deciduous roots to get room for the permanent set. But that is entirely a different question and explainable only by the law of development. When we are speaking of solution with reference to the law of development, it is a different thing from solution under the domain of corpusculosophy into a vegetable state of life-tissues going back into cellular and crystalline conditions. You may not understand the difference between cellosophy, crystalosophy, and corpusculosophy. Crystalosophy is a representative of the mineral kingdom, and is invoked as an operating agent in the formation of stones, metals, etc. Cellosophy is the vegetable mode of development, and in this measure of togetherness we have another endowment of power. Then there is corpusculosophy, which is the domain of the amœba of which we are talking, the representative of the animal kingdom, which means amœboid movement; that kind of solid bodies which are not differentiated with an exterior and interior; a protoplasmic mass with about an equal consistency of body throughout, so that you may say it has all things,—all skin, all heart, lungs, liver, gland, everything; or, in other words, it holds competency to perform all these functions. We must comprehend these divergent nerve-currents; and we must know that the current, being arrested by cold, is not death; for, if it were death, we would have a chemical conglomeration of all having the strength and consistency of amœba. When inhaled, and brought into contact with this amœba, the chemical equivalencies would be satisfied and the whole system would be dammed. We should take all these things into consideration, and get

something of an understanding, instead of going so far as to attribute to mechanical pressure the entire neuralgia. The point I wish to make is that Dr. Peirce was influenced more by nomination than by observation of fact. Every act has its dynamic, chemical, and physiological expression. Through all of these varieties of movement, dynamic, static, and chemical, we have the power by which physical machinery is operated.

Dr. Kingsbury, of Philadelphia There is only one point in Dr. Peirce's paper on which I wish to speak,—namely, in reference to one of the causes of facial neuralgia. I think the doctor mentioned, under the causes of this affection, the presence of nodules in the pulp-cavity. I have in my practice met with these pulps, and have found them to be a very marked cause of neuralgia. To illustrate: some years ago a lady came to me from Newtown, in Pennsylvania. She had had trouble for several months with a right superior second molar. She had applied to her physician repeatedly, and he had exhausted his skill in endeavoring to allay the neuralgic pain. She at length fell into my hands, and, in examining the case, I met with the difficulty of diagnosis that very frequently attends cases of this kind. In carefully examining the teeth upon the left side of the upper jaw, I found the second superior molar had a slight indication of caries upon the distal approximal surface; and, on very careful examination, I decided that this was the cause of her trouble. My course of treatment was to drill into the tooth and obtain access to the pulp. As soon as I had obtained such access I made an application of arsenious acid and morphine, for the purpose of devitalizing the pulp, and subsequently I increased the excavation to obtain more ready access. In opening into the pulp-cavity I removed several small nodules, and finally came to a very large nodule in the larger part of the chamber. It was spherical and fully the size of a single B shot. I removed this, with some of the small nodules, extirpated the pulp, and the lady went away greatly relieved. I subsequently filled the canals and the roots, and heard afterward that the neuralgic pains did not return. The nodule was of such an unusual size that it was mounted by my friend Atkinson, who made three very beautiful preparations, himself retaining one section and Dr. White another. I have the third in my possession.

This nodule has the appearance of being quite as dense, if not more so, than normal dentine. It shows a nucleus in the center, with concentric rings, suggesting the formation of dry nodules by gradual accretion of osteo-dentine around the nucleus in the center. I have no doubt that these nodules were the cause of this lady's suffering. I have had numerous other cases producing similar consequences, but none of them so marked in their character, and none where the nodules proved to be so large, as in this case.

Dr. J. S. Latimer, of New York. Perhaps, gentlemen, it may have struck you that, in a microscopic examination of the circulation in aquatic plants, can be seen the effect of the withdrawal of heat in influencing that circulation. If the heat is withdrawn the circulation is more or less suspended, and if you desire its resumption you must increase the temperature. We have these amœboid movements stopped. If you will turn to the enamel-tissue, you have like little masses of matter to those which we discover circulating in the fluid or stub of the plant (which are their equivalents in the blood). Cold stopped them in their course in the plant, and I think by analogy the same thing would be true of the enamel-tissue. We have stasis without death.

Dr. Flagg. When Professor Peirce speaks of the death of a thing, we must accept it as death comes to our apprehension. When you speak about your amœba motion, how amœba motion exists in that iron column, it is not necessary to look into the animal economy for this. There is molecular motion taking place in that iron column, but we can't go over and over this into its ultimate analysis; we mean a certain action is taking place. If the molecular action going on in this iron column was to be so solidified and stopped by the withdrawal of heat as to render it brittle, as in the tire of a carriage or the wheel of a railroad-car, or anything that is liable to be interfered with, whenever that takes place the result has occurred which we express mechanically when we say it is a broken wheel. It is *practically* a *dead* wheel. But is any part of the wheel dead? All those broken pieces may be brought together, may be vivified by heat until they are melted, and that wheel can be made into plastic material, recast into a wheel, and be restored to its original condition. There is no such thing as death. Yet we cannot go into this fine analysis, nor is it necessary. I trust, for the sake of the intelligence of my brethren here, that we understand the scientific principles which underlie the mechanical expression. And I say it is better for us, having understood it, to use the mechanical representation than to go into this minutiae. We know that, under fundamental peculiarities of condition, irritation takes place. There is a tangible result, a result which is just as practicable and tangible as possible.

This fifth pair of nerves is a wonderful part of our economy. To illustrate that: Place in our chairs a man who could march up to a cannon's mouth, *provided* he could only *shut his mouth and clinch his teeth*. At liberty to do this, he will make a charge with his musket with undaunted courage. But just put that man in a dentist's operating chair, and say to him, "*wider, wider;*" what have you done with him? Now, gentlemen, is there nothing strange in this? What action takes place on the general nerve-sensibilities which, by pressure on the terminal filaments of that fifth pair of nerves, so strings up the whole sys-

tem as to make a man capable of almost any endurance? Do you suppose when those martyrs of old times went to the stake that they kept their mouths wide open? If they did, and sang psalms, then when the fire burned hotter and hotter, did they open their mouths wider and wider? No, sir! they went as is said in the books, "with stern resolve, and *clinched TEETH*"! Why is this?

A special name has been given for this seemingly apparent purpose. How do you know it has ramifications which extend below its sensibility? When you etherize a man, if you don't do it thoroughly, he will assure you that the operation has been painful. When the general sensibility is so low that you could cut off a leg, that is the moment when the irritation through the fifth pair of nerves is produced, and the liability to injury of that nerve is the greatest. You must carry the thing farther down into the medulla oblongata before you can obtund the sensibility in the teeth or pulp. There is something very strange in this. I have given seven years of my life to the systematic and persistent investigation of this fifth pair of nerves. It seemed apparently simple when I commenced that investigation, but it becomes more and more wonderful and complicated and confusing as I progress in it.

Prof. McQuillen. It must be apparent to all that our knowledge of nutrition and of irritation is dependent upon an intimate acquaintance with histology. It is a fact that under the microscope we have been able to make more thorough investigation than in other ways, although by that means we cannot observe the process of nutrition as an act. Nutrition may be properly said not to be an object of microscopic examination, although we draw conclusions with regard to its laws and results. We know more about inflammation in its various stages, because the microscope has been used in its examination. We have acquired, under such circumstances, a knowledge of inflammation that we could not presume to before the introduction of such a method of investigation.

I regret that I was not able to hear the paper of Dr. Peirce. I am informed—I would like to know whether correctly or not—that he said in the course of his paper that extreme cold, acting upon the white blood-corpuscles, produces the death of those corpuscles, and hence is a source of irritation, and that the white corpuscles are the important agents as tissue-builders.

Dr. Peirce. I used the term simply as expressing the want of vital action in the white blood-corpuscles, and said that some physiologists regarded them as tissue-builders.

Prof. McQuillen. It is a new idea, and there may be truth in it; but when we take into consideration the relative proportions of the white corpuscles to the red corpuscles,—one white to three hundred of the red,—it seems somewhat questionable. I should like to

think over that matter very seriously before I would be prepared to accept it as a correct interpretation. Then again, we really don't know what the functions of the white corpuscles are. They have been regarded as embryonic red corpuscles; yet, singular to say, they bear the proportion to the red that I have mentioned. They are also larger in size, whereas an embryo is usually smaller. The diameter of the red corpuscle is one-thirty-five-hundredth of an inch; that of the white is one-twenty-five-hundredth of an inch. In addition to the white corpuscles being regarded as embryonic red corpuscles, it has been advanced by Carpenter and other physiologists that they are factors of fibrin and albumen. This is all theoretical; we are in the woods. There is too much of theory, and not enough of real practical knowledge, in relation to these points.

There is one point to which Dr. Peirce may have referred in enumerating and explaining the causes of facial neuralgia. But lest he may have passed over it, I will briefly explain. He stated that irritation in the periphery of the nerve was due to the presence of nodules in the pulp-cavity. In addition to this, neuralgia of the most aggravating character may have its origin in compression of the branches of the fifth pair of nerves near their point of origin at the ganglion of Gasser. There are three of these branches, one passing through the sphenoidal fissure, the second through the foramen rotundum, the third through the foramen ovale. Occasionally pain of an intense character has been experienced by the patient, and the extraction of all the teeth has afforded no relief. After the death of the patient, there has been found either thickening of the periosteum covering these foramina, or an osseous formation decreasing their size and pinching the nerve, or an osseous tumor at the base of the brain pressing upon one of the branches of the nerve. This has led to the extirpation of the second branch of the fifth pair of nerves, with a view to relieve persons suffering from such terrible pains. I take it for granted that Dr. Peirce has directed attention to that point. These are certainly some of the most prolific causes of such pains.

Dr. Peirce. Had Dr. McQuillen been present during the reading of my paper, he would have seen that there is nothing therein regarding the offices of the red or white blood-corpuscles. I *spoke* of the sensibility of the latter to cold in order to illustrate my statement that harmony of function is possible only within certain limits of temperature. I said, "death" of the white corpuscles; I meant *the arrest of their life-force for the time*. I have watched the white blood-corpuscles in the microscope for hours. Let me illustrate on the blackboard.

Take this (*A*) as a blood-vessel. Floating within it are the white blood-corpuscles (*BB*). One of them comes to the side (*C*), attaches itself, and elongates and passes through like this (*D*).

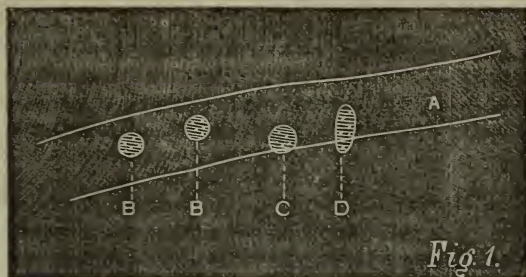


Fig. 1.

Some physiologists state that these white blood-corpuscles are tissue-building bodies. It is a very natural inquiry whether, through their extreme sensitiveness to thermal changes, an arrest of life-force, or, at least, functional inharmony, might not be produced by their exposure to low temperatures; and, supposing such arrest of movement in the capillaries from cold or other cause, the then natural inference would be an expression of discomfort through the nerves distributed to that locality, either local or reflex, or both.

The application of cold to the elongating corpuscle (*D*) stops its action (which is amœboid movement). Thus influenced, it remains for a time; but whether it is afterward absorbed, or whether, subjected again to heat, it is enlivened and goes on its way a living force, I am unable to say.

A word in relation to the impaction of the third molar. My allusion in the paper was solely to its mechanical effect when there is a want of correspondence between its development and the absorption of the hard tissues above it. I will illustrate my idea:

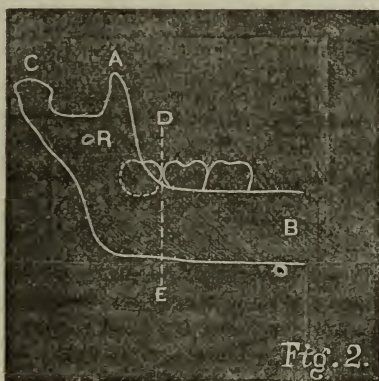


Fig. 2.

We have here (*R*) the ramus; here (*B*) the body of the bone; the coronoid process (*A*) and the condyle (*C*) are here; and this (*D*, *E*) is the line of the posterior surface of the second molar. It is a recognized

fact that each molar is developed at the base of the coronoid process, and room for the development of subsequent molars is gained by absorption of the anterior line of the ramus, with adhesions and calcification to the posterior,—the bone growing not at, or from, its anterior part, but elongating posteriorly to the molars by this process of absorption and development.

Here, in the ramus, at the base of the coronoid process, we have the cavity of reserve for the third molar,—just as we have had for the previously-developed molars. It progresses this way,—calcification, first cusps and crown; enlargement of the pulp-mass; its bifurcation for the roots; and the deposition of salts of lime therein. By this development the crown is elevated; and if there is not a corresponding absorption of tissue from above, these solidified portions of the roots must press back upon the uncalcified pulp; and this receiving its nerve-filaments from the dental branch of the trifacial, it is not difficult to understand how we have the general nervous disturbance which so frequently supervenes.

A member. I would like to know if the action of the blood-corpuscles described by Dr. Peirce is regarded at this day as a physiological expression of activity.

Dr. G. S. Allan, of New York. Cohnheim has demonstrated it repeatedly.

Dr. Atkinson. I have made a distinction between this being a pathological and a physiological act, in my observations on inflammatory processes for the last fifteen years; even before Cohnheim. I asserted that in 1859, in the presence of George S. Allan, and he said I was improvising.

Dr. G. S. Allan. I think you are now.

Dr. Atkinson. I am happy to say that people are advancing by degrees in the apprehension of these truths. As to the physiological act, I think I am not entirely deficient in knowledge of it, having made something like a survey as to its being so, and as to the blood-corpuscles being "seed-bodies of the tissues." I have spoken that, and written it, and it has been published repeatedly. I don't say it has been proved; I put it forth only as my opinion. The red corpuscles are used up in the contraction and expansion of the muscles. Now for proof of that: Old muscle is always highly colored,—plenty of cruorin in it. Young muscle is hardly colored at all. The first formation of muscle is not perceptibly differentiated from the nerve-tissue unless you can get at the ultimate fibrils. I lay down this proposition then,—that the color of the contractile mass is in consequence of the destruction of the red corpuscles and the deposit of the globulin in the ultimate elements of the muscles, and in which it is retained, within whatever may constitute pellicle, so called. One Philadelphian says he can show

the cell-wall of the red corpuscle. I hold that is a post-mortem effect. It is a chemical act, and not a physiological act. It does not belong to the system. I am aware that I have just as good evidence for the support of my theory as he has for the support of his. He cannot go into living organisms and inspect living red corpuscles so as to assert positively that they have a cell-wall and nucleus. I hold that these are the seed-bodies of all tissues; hence the sequence of the statement made that, function being interfered with, metamorphosis in the tissues would be a source of neuralgia and other abnormal operations.

Prof. McQuillen. Reference has been made to Dr. Richardson with regard to the cell-wall of the blood-corpuscles. Whether it is a post-mortem result or not is a question. Dr. Richardson has demonstrated to my satisfaction, and, I think, to the satisfaction of a great many others, that the white corpuscles do migrate through the vessels, as was observed by Dr. Peirce; and that the corpuscles we find in the saliva are migratory white blood-corpuscles. He proves this by a series of experiments which may be seen in his admirable paper.

In relation to the process of nutrition. The blood, as it circulates in the vessels, is made up largely of what is known as the liquor sanguinis: this is composed of water, albumen, fibrin, salts, and the red and white blood-corpuscles floating in it. The albumen, fibrin, and salts are the essential elements of nutrition. They are present in the blood in a state of solution, and by the law of osmosis pass through the walls of the capillary vessels, and are assimilated by the tissues.

Dr. Atkinson. You asserted that fibrin was in the circulation. Is that a building material, or not?

Dr. McQuillen. I would answer by saying that prior to the time of Galileo it was believed the earth was the center around which all the planets of our solar system moved. Galileo said the sun is the center of this system, which statement he was compelled to recant by the inquisition. This is but an illustration of what is often presented in science, viz., just the opposite of what was implicitly believed in yesterday is accepted as true to-day. Thus fibrin was regarded formerly as a histeo-genetic substance out of which tissues, particularly muscles, are to be made. Liebig found that fluid fibrin in the blood, and what was called solid fibrin in the muscles, are two entirely different things, that they are composed of elements in a different state of combination, and hence some physiologists jumped to the conclusion that fluid fibrin in the blood is not a histeo-genetic substance, but, on the contrary, consists of broken-down materials which are fit only to be thrown out of the system. I think, however, there is good reason to regard it as a histeo-genetic substance.

(To be continued.)

FIRST JUDICIAL DISTRICT DENTAL SOCIETY.

REPORTED BY F. M. ODELL, D.D.S.

At the meeting held in October, resolutions suitable to the sad occasion were voted in reference to the demise of the late president, Dr. R. M. Gage, and a copy of the same sent to the bereaved family.

At the November meeting, Dr. Corydon Palmer, in speaking of the underlying causes of decay of the teeth, nominated "hereditary transmission" as the chief cause.

Dr. Atkinson called attention to the fact that decay always commences not at points of contact of the teeth, but just beyond such points.

At the December meeting Dr. Atkinson read a paper on "Dental Materia Medica," treating especially of salicylic acid and iodide of zinc.

Dr. Kingsley introduced Dr. Frank H. Hamilton, with the following remarks:

Dr. Kingsley. For some time past we have seen in all the dental journals, and heard in our associations, much in relation to the status of the dental profession. There has seemed to be a vague idea that the profession held a position above what was generally accorded to them by the public and by the medical profession. There has been an under-current of this kind manifesting itself in all the meetings which I have attended. It has also shown itself in another form: certain gentlemen of the dental profession have applied to medical societies for recognition and membership, on the ground of being graduates of medical colleges, and, having never violated the code of ethics, claimed an equality, and it was denied them. I have wondered about this matter a great deal, particularly while the discussion of dental colleges has been going on. Knowing that Professor Hamilton had expressed himself before another body of dentists upon this subject, I have asked that he would kindly come to us, and speak upon this subject. I should like to hear the views which are held by the medical profession. We have listened so many times to our own story that it may prove profitable to hear the other side. For my own part, I have very little sympathy with the restless anxiety for a recognition which may possibly be withheld by either a class of men or the community. I have always felt that, if we did our work honestly and skillfully, it would not be long before we were recognized to the full extent of our deserts, not only by suffering humanity, but by that Greater Physician who spent this life for our benefit.

Dr. Frank H. Hamilton. Gentlemen,—In monarchical governments the arts and sciences look, in a great degree, for their elevation and support to royal and noble patronage. To be "perfumer in ordinary" to her Royal Highness or to the Duchess of Sutherland is to have

achieved fame and fortune. In this country everything is done by association. Politicians and rogues combine to form "rings." Men of letters club and dine together, and men of science organize associations and talk together. In this city there is not an evening during the week, except in the months of July and August, which is not occupied by some one of the numerous medical societies.

The rapid and surprising advance of dentistry in this country dates from the period only a few years back, when you "organized"—that is the term—your first dental association. First there was association; then dental journals; then dental colleges.

So our habits are moulded by the demands of our institutions. We have refused the paternal care of kings and of princes, and we have no hope or help left except in union. Like ants, we form ourselves into families, and then set to work, each man depositing his grain of sand; and then the habitation is speedily constructed.

Only a few evenings since, I accepted an invitation to address an association of dentists; and I have cheerfully complied with a similar request from my friend Dr. Kingsley to meet and converse with you this evening. My only objection was, that I had said pretty much all I had to say upon this subject to the other gentlemen; but he disposed of this objection by saying that I might, if I chose, repeat what I said on that occasion. This was so generous and confiding—for he had very little idea what I had said—that I could no longer hesitate.

I propose, then, gentlemen, to speak of dentistry in a somewhat general way; that is, as seen from my own stand-point,—the stand-point of a physician and surgeon. What is dentistry? The term, as employed to-day, includes mechanical dentistry and dental surgery.

1st. *Mechanical Dentistry* is the art of cleaning, filling, setting, adjusting, and extraction of teeth; and, if the operator chooses, he may make his art include, also, the manufacture of teeth.

It is scarcely proper to call one a dentist who only manufactures teeth, any more than it is proper to apply the term orthopædist to one who manufactures orthopædic apparatus, or the term ophthalmologist to one who makes lenses, or the term gynæcologist to one who constructs pessaries; but, if one both makes and sets teeth, he is a mechanical dentist. This would seem to be the natural and proper limitation of the term in one direction. On the other hand, the mechanical dentist is not necessarily or absolutely limited to what is purely mechanical. Such a rigorous and exact line of separation between cognate arts and sciences, or between closely-allied professions, or between specialties and departments of a profession, is scarcely possible, and is never insisted upon. The man who adjusts teeth, or who fills and cleans teeth, must be permitted to advise as to the manner of preserving teeth; and there are many minor surgical

affections of the jaw in which his experience, position, and the adaptability of his instruments render him the safest adviser and the most skillful operator; for, after all, you understand, this constitutes the only proper guide in the division and distribution of the various departments of medicine and surgery,—not what is best for the doctor, but what is best for the patient. We have no right to distribute maladies; but it is their right to distribute themselves to whoever and whatever is most likely to cure them. It is evident, however, that there must be somewhere a natural limit to their sphere of usefulness. It must include its own atmosphere, but it must be careful not to encroach upon the atmosphere of other spheres, and simply because, out of its own atmosphere, it is pretty sure to grope in ignorance and in blindness.

You will observe how naturally the mechanical dentist comes to the relief of the surgeon, even in the treatment of certain examples of broken jaws, where such appliances are required as only an expert mechanic can make and adjust,—that is, a mechanic familiar with those tools and manipulations which are employed about the jaws. We understand perfectly that you can do this kind of work better than we can, and we hand it over to you as a part of your possessions; but, if we did not, it would go to you inevitably by that natural law of distribution to which I have already referred.

It does not follow, however, that you will manage any better than we do all fractures of the jaw. Indeed, I may be permitted to say that you will probably not manage most of them as well as we, since it is not to be supposed that you are so thoroughly grounded in the general principles which underlie the treatment of all fractures; you have not had the broader experience of the general surgeon, and do not know so well the causes of delay in union, and many other matters relating to this subject, which come only of extensive reading and experience.

I have, then, attempted to define, according to my views, the term “mechanical dentistry.” The definition is not complete; but, in this respect, it is in the same situation as all other specialties in our profession, between which and many others it is often impossible to draw sharply the lines of demarkation.

Mechanical dentistry is primarily and essentially an art,—a mechanical art and a fine art,—since it requires not only skill in the use of the hands, and in the manipulation of metals and various other compositions, but also judgment and taste in the adaptation of the teeth to the features of the face. The skillful dentist aims no less at æsthetic effect than at mechanical perfection and durability.

Mechanical dentistry is, I repeat, primarily and fundamentally an art. Art was the original crystal; but it has steadily grown since its first formation, by the addition of new discoveries in art, and by the gradual accretions of science.

It is a handicraft demanding, first of all, skill in the fingers; but it requires science for its completion. For this reason, it is easier to make a good mechanical dentist of an average jeweler than of an expert doctor. I have often seen the watchmaker transform himself into a dentist, and make a most excellent workman and a useful man; but it is very seldom, in my observation, that a man educated at first as a surgeon and physician has converted himself into a good mechanical dentist. It is an attempt to make the cone stand upon its apex instead of its base. The workshop and the laboratory make mechanical dentists, but medical colleges do not; and it seems to me absurd to suppose that they ever can.

2d. *Dental Surgery.* I have taken the liberty of assuming that the terms employed by me to designate the two important classes of dentists are appropriate. They have been occasionally employed in the same manner by dentists themselves, and they serve my purpose in the classification of the topics, and in the arrangement of the remarks which I am now making.

A dental surgeon is one who is qualified and authorized to practice not only most, or all, of mechanical dentistry, as the term has been defined by me, including, perhaps, much of the minor surgery of the jaws and possibly of the entire buccal cavity: he is one who feels himself competent to diagnosticate and remove all tumors occurring in this anatomical region; to extirpate large portions of, or the entire, maxillary bones; to overcome ankylosis; to operate for cleft palate, etc.

Between the mechanical dentist and the dental surgeon there is a pretty wide difference,—indeed, a much wider difference than between the general surgeon and the dental surgeon,—inasmuch as dental surgery is but a branch of general surgery, to which mechanical surgery has been added by way of supplement; while mechanical dentistry has no necessary relation to dental surgery, its connection being accidental, and only such as arises from proximity and association. To explain the matter as a grammarian, I would say, in the term “mechanical dentistry,” the word “dentistry” is the noun or the subject, and the word “mechanical” the qualifying adjective; while in the term “dental surgery,” “surgery” is the noun and “dental” the adjective.

I repeat, then, gentlemen, that dental surgery is a branch of general surgery; and whether it includes all varieties of mechanical surgery or not, its practice demands peculiar qualifications. It is just as much a department of general surgery and medicine as are ophthalmology, otology, gynecology, lithotomy, etc., and demands of its practitioners precisely the same general qualifications. No one has ever thought that any man is properly prepared to practice in either of the departments above named until he has obtained that general knowledge of medicine and surgery which is implied in the degree of doctor in medi-

cine, obtained after a regular course of studies and a thorough examination. I say after examination, because honorary degrees are occasionally conferred by our medical colleges, and always without examination. It is needless to say, therefore, that such degrees ought not to confer the right to practice.

A part of the human body cannot anatomically, physiologically, or therapeutically be separated from the whole. Here the greater always includes the lesser. If any one thinks differently, if he believes that he can know all that is to be known about the diseases of the jaw or face without a knowledge of the diseases of the whole body, he proves only that he has had but a limited experience in the subject, that he has given to it but little thought and study, and he is not in agreement with almost the entire body of intelligent physicians and surgeons.

Dental surgery is, then,—to complete the definition,—primarily a science, to which the art of dentistry has been added as a supplement. Any surgeon has the right,—and his right comes out of the natural justice and fitness of things,—any surgeon has the right to restrict himself to the jaws, or to the buccal cavity, in order that he may devote his talents and skill more definitely to the relief of the maladies of these regions; but no man has a right, because of its unfitness, to practice major surgery upon the jaws, or upon any other portion of the body, unless he is acquainted with the science of surgery.

Dental surgeons are specialists in surgery, and hold the same rank, and need the same general preparation, as other specialists in surgery.

Permit me, gentlemen, in closing these remarks, to say to you how much I respect and appreciate your calling. Whether you practice as mechanical dentists or as dental surgeons, there is, perhaps, no difference in the dignity of your respective vocations. It is not even apparent that the one demands the exercise of more talent than the other, but each certainly demands a different education and training.

There is no duty which we can perform to relieve the suffering of man, or, indeed, of any sensitive, living creature, which is undignified. It is the purpose for which the act is performed, and the manner in which it is performed, which determine its rank. The duties of a surgeon and of a physician are often, in themselves, sufficiently humble, but they are never humiliating.

My respect for you, gentlemen, is not, therefore, based upon the exact nature of your calling, as to whether it is a handicraft, an art, or a science, but mainly upon the fact that your profession is useful to man, and that you have shown so much zeal and industry in its pursuit. Especially, I may be permitted to say, have the dentists of this city and country made most remarkable progress.

I see before me gentlemen who have acquired world-wide reputations by their inventions and by their contributions to dental science,

and in every part of our land there are hard-working, ingenious, and talented men who are working in the same field. If you accomplish as much in the next thirty years as you have in the last, there will not be much left for you to do in the way of regulating the teeth, and you will be compelled to extend the area of your work in order to keep yourselves from being idle. Perhaps then you will invent a bridle for the tongue

Dr. Kingsley then introduced Dr. Henry B. Sands, a medical practitioner, who, explaining that he had not expected to be called upon to say anything, expressed his entire willingness to concede the claims of dentistry to be considered a specialty of medicine; was quite aware of the necessity for a good set of dental organs in order to maintain the general health, and quite certain that it required more than mere mechanical skill to produce the best result in dental practice. He had always thought, however, that it was very doubtful whether dentists will ever find it to their advantage to practice surgery of the mouth; believed that in so far as they engaged in that kind of practice they would injure their proper or regular practice. He claimed that one in the active practice of dentistry would find neither time nor inclination to engage in the surgery of the jaws. He said that some years ago some dentists made application to have a dental department attached to the college with which he is connected, but it was not deemed advisable to make the experiment. They felt unwilling to undertake that which they knew they could not perform with credit to themselves or benefit to the dental student. Dr. Sands said he was aware that there was an intimate relation between dentistry and medicine, but he felt quite sure they would not fuse. He could not conceive of a busy surgeon stopping to extract or to fill a tooth; and so he could not conceive of a busy dentist leaving his specialty to engage in any other department of medicine or surgery.

Dr. Kingsley then introduced Dr. J. Smith Dodge, Jr., as representing the medical and dental professions combined.

Dr. Dodge said he believed that, as a rule, people got just about the amount of recognition which they were entitled to, and that there is no legerdemain about it. He had never had doctors of medicine give him the cold shoulder, and therefore did not feel a very profound interest in the subject; thinks the matter will settle itself; thinks that when a recognition of dentists as specialists in medicine is talked about, it is well to know what kind of dentists is meant. Knows a good many honest, good men who have no claim to be recognized as specialists in medicine; did not mean to speak in disparagement of them, however, but only of the fact that they had no possible claim to be considered as in any degree entitled to recognition as practicing a specialty of medicine. Many of them are excellent mechanics and excellent artists; and if

there were nothing more he would not be ashamed to be one of them. They do the work they undertake skillfully and with benefit to their patients. He objected to dentists in a lump being pronounced medical specialists. A medically-educated man may turn his attention to dentistry and make it his specialty, and deserves to be ranked a medical specialist, but only because he is first a doctor in medicine.

He would not take the responsibility of educating a man for the dental profession without first educating him in medicine. When a graduate in medicine elects to practice dentistry, he practices it as his specialty of medicine, and is better qualified to practice dentistry with medicine as the foundation. If a dentist is simply and only an operator upon the teeth, he will be honest to claim no more than this; but, if he is a doctor of medicine practicing dentistry as a specialty, he will be a doctor, no matter what practitioners of general medicine may say.

Dr. Atkinson said it is the man and his development that determines his fitness for one practice or another, not the kind of shoulder-straps he wears.

Dr. Bogue said: We, as a calling, are almost as much divided as the dental and medical professions can be; and, however hard our medical brethren hit, they can hardly hit harder than we do among ourselves.

Adjourned.

At the January meeting, Dr. Atkinson read a continuation of his paper, commenced at the last meeting, on "Dental Materia Medica."

A discussion ensued, principally between Dr. Atkinson and Dr. George S. Allan, about cell-life, which occupied the larger part of the evening.

Dr. C. E. Latimer said that he had been experimenting since the meeting of the Odontological Society with injections of glycerin in abscesses, and withdrawing the contents of the cavity by a reverse action of the syringe so as to remove the pressure. He said that, so far as he had tried it, it seemed to work successfully, although, at first, he had not much faith in it; had heard that others had been experimenting with carbolic-acid solutions in the same way.

Dr. Latimer spoke of four cases which he was treating, which were very peculiar,—abscesses without apparent cause. In reply to various questions, he said the four cases alluded to were all in the lower jaw; the teeth in the neighborhood sound and apparently alive and healthy, the fistulæ being in the labial side and opposite the molar teeth. He had sometimes seen such results caused by a bristle from a tooth-brush or a sliver from a wooden tooth-pick; but in the cases alluded to he could discover no cause whatever.

Dr. Latimer offered to arrange that the society should see one or more of these cases.

Dr. George S. Allan said : I desire to draw the attention of the society to the use of chromic acid for destroying pulps. I have a case in which, for reasons peculiar to the patient, she would not allow me to use arsenic, creasote, or any of the agents we have been accustomed to use for destroying pulps, and her health is too delicate to allow me to extract the pulp without devitalization. I have been exceedingly bothered to know what to use to destroy it. To-day I placed rubber dam over the tooth, fastened it with a clamp, and applied a crystal of chromic acid to the pulp. It has destroyed it almost completely, and I expect one or two more applications will finish it. It was the only agent I could think of under the circumstances. I have never heard of its employment in this direction.

In reply to a question by a member, Dr. Allan said the application did not cause much pain, and he thought that which did follow was more the result of mechanical pressure than of the action of the chromic acid.

On motion of Dr. Allan, a committee was appointed to invite Dr. Taylor to present his views on dental nutrition at a future meeting.

Adjourned.

IOWA STATE DENTAL SOCIETY.

THE annual meeting of this society will be held at Burlington, commencing the third Tuesday (16th) of May, 1876.

J. P. WILSON, *Corresponding Secretary.*

EDITORIAL.

ETHICS OF JOURNALISM.

THE editor of the *Pennsylvania Journal of Dental Science* refers to our request, in the February number, that credit should be given to the DENTAL COSMOS for the paper of Dr. Peirce, copied from its pages by that journal, and says he cannot see his way clear to comply with the request, because the paper in question was read before the Pennsylvania State Dental Society, and therefore the Transactions of that society should receive the credit. He complains, moreover, that "a large percentage of the matter which should have been the property of the society and held by the Publication Committee until it was published in the Transactions, was obtained only as published original matter from the COSMOS."

If Dr. Welchens was standing on a principle in this matter, and had illustrated his convictions in the conduct of his own journal, we could respect his position; but remembering that he is one of the Publication Committee of the Pennsylvania State Dental Society, "by whom the

papers should have been held until after they had appeared in the published Transactions," we must conclude either that his convictions are of recent date, or that he violated them by publishing in the December number of the *Pennsylvania Journal*, before the publication of the Transactions, and not taken from the DENTAL COSMOS, but printed from the manuscript of the author, the papers of Dr. Darby on "The Electro-Magnetic Mallet," and of Dr. G. W. Klump on "Hygienic Laws;" and that, too, without credit to the Transactions, whose claims to credit he is now so ready to defend.

Nor can the fact be overlooked that Dr. Peirce's paper, as published in the DENTAL COSMOS, was prefaced by the words, "Read before the Pennsylvania State Dental Society, July 13th, 1875," the only line which in the "verbatim" copy the *Pennsylvania Journal* omitted, and mention of which was likewise strangely overlooked in the editorial notice which invited special attention to the "leading paper."

As Dr. Welchens has invited an expression of our opinion as to where the credit belongs in such cases, we cheerfully respond. The credit for any article copied should be given to the source whence it is obtained. If it seem desirable that the credit should be given to a *forthcoming* volume of Transactions, he should wait patiently until the volume is issued, then copy and credit, not by the simple word "Transactions," which means nothing alone, but with the addition of the name of the society from whose transactions the article is copied. To this opinion we venture to add another, viz., that Dr. Welchens will not interfere with the vision of any other person by throwing dust in his own eyes.

PERISCOPE.

THE SCOPE OF DENTAL SURGERY.—The duty which devolves upon me of giving you a course of clinical lectures and demonstrations on dental surgery is a peculiarly pleasant and congenial one, inasmuch as I have to address a body of gentlemen who are studying medicine and surgery in a general hospital, upon a subject which has been looked upon too much in the light of a specialty, more separate than other specialties from medicine, and which I fear, as a rule, does not meet with that measure of attention which is its due; although, if you would give even a very small proportion of your time, in comparison with that allotted to your other studies, to its consideration, I am certain that you would thereby render yourselves good service in a future day. I fear that there are too many not only of those who are without the ranks of that branch of surgery which I profess, but also of the less highly-cultivated practitioners within them, who seem to think that the practice of dentistry merely implies the filling or extraction of teeth; and I must confess that I have often been surprised at the ignorance of intelligent members of our profession in relation to diseases of these organs. Feeling strongly as I do, as a surgeon, the

rapport existing between this specialty and general surgery, I shall attempt to show you to-day, in this introductory lecture, the necessity, on the one hand, that the dental practitioner should not only be a fully-qualified, but also an intelligent, surgeon, and, on the other, that the general surgeon, ay, and the physician, too, may derive some benefit from studying those diseases, direct or indirect, which have their origin in morbid or abnormal conditions of the dental structures. You all recollect the fable of Menenius, wherein he pointed out to the dissident plebeians the harmony existing between the various parts of the human frame, applying the moral of his story to their divisions with the patrician body of the state. Now, the teeth are in as intimate relation with the body generally as is the eye or ear, and their morbid conditions can only be treated rationally upon such acknowledgment. The oculist and the aurist are fully-qualified practitioners. The dentist should be so also, and it seems to me ridiculous that men should cavil about their status and position in the social scale, if they do not choose to educate themselves as other specialists are educated. The teeth must not be looked upon as mere pegs or nails inserted into living structure, but as organs having the most important relation to the whole system; and I think that I shall be able to prove to you that there is not a period in life when some knowledge concerning their development and condition may not be of service to you in any branch of practice, whilst the special objects of my future demonstrations will be to give you practical illustration of the treatment and diagnosis of cases quoted here, and to show you those operations which, having for their object the relief of pain or the arrest of disease, may be especially useful to those in country practice, or to those about to be engaged in the naval and military service of their country.

Firstly, consider, with me, the position of the maxillary bones, in which the teeth are implanted. Consider with how many nerves, with their attendant ganglia and plexuses, those teeth have connection. On each side, the oral cavity is in close proximity to the internal and external ear. Above, it is in near relation to the orbits and that oft-troublesome cavity the antrum, which is again in contiguity with the nasal fossæ, the contents of which are frequently affected as a result of dental disease; whilst, finally, the continuation of the oral aperture leads to the stomach, in which arise, should assimilation be imperfect, the first causes of faulty structural development, or in which are produced, if dyspepsia exist, those acids which, being eructed into the mouth, constitute a local source of dental lesion; whilst the unhealthiness of the mucous membrane of the gums may serve as a valuable means of diagnosis in various morbid conditions of the gastro-intestinal mucous tract.

The necessity of some knowledge of dental surgery to the general surgeon, and of medicine to the specialist, is shown from the earliest period of existence. Caries and imperfection of tooth-structure are to a very great extent, I regret to say, diseases of civilization; and my experience as a traveler in many parts of the world has taught me how much influence climate and *modus vivendi* have not only upon the condition of the teeth, but upon the body generally.

As a rule, the savage or aborigine scarcely suffers from dental lesion, save in those instances where the conditions of his life are peculiarly adverse to constitutional integrity. The freedom of the aborigine from

disease undoubtedly depends, to a great extent, upon the healthy life he leads. His hours are regulated by the rising and setting sun, whilst his occupations all conduce to health; but, when the country is notoriously unhealthy, his system is affected by the existing factors of disease; thus it is remarked that, on the eastern side of the Rocky Mountains, where the climate is healthy, and bone-forming food abundant, caries is unknown; whereas, on their western boundary, where animal food is very scarce, and the vegetable diet deficient in those elements which are the chief ingredients of osseous tissue, disease is not unfrequent. Mine has been the same experience in relation to the Zulu and Bosjesman tribes in Africa, and also with regard to various parts of China. If you ever happen to be near Hythe, in Kent, and will visit the old church there, you will see hundreds of the skulls of our Anglo-Saxon progenitors, and will find that their maxillæ are well developed and firm in structure, with not a tooth decayed in young or old; and in this specimen, at least two thousand years of age, found in a sarcophagus during excavations made at Cumæ some short time since, you see another proof that the changed conditions of modern life present important factors in the induction of disease. If you will examine more modern skulls, a very different story will present itself, decay revealing its ravages on every side. The causes of this disintegration of tissue are numerous. Change of climate may alike produce or arrest disease; thus, when the healthy Irishman or Scotsman quits his home for another habitat, where potatoes and oatmeal, rich in bone-material, are not abundant, in a few years he suffers from disease alike with those among whom he has sought another home; whilst, on the other hand, another person may regain new health in another clime, and the tendency to disease may cease. The argument from these facts is that, inasmuch as it is proved that a constitutional condition can exist in which the teeth may be free from caries, there is no reason why, if we discover the conditions of this immunity, we should not be able, in the course of a generation or two, to bring about a like result; for all evidence tends to prove that there are constantly-recurring changes of waste and repair taking place in the dental tissues as in other parts, though naturally their structure forbids these being as rapid as in other tissues. I am confident that the prevalence of dental disease in the present day is in no small proportion of cases a direct consequence of the way in which our food is over-refined and prepared, so much so that it is too frequently almost entirely deprived of those elements which are most requisite for the formation of firmly-knit bones and healthy muscle; and I fear that parents will never be taught to understand, until they are instructed in the elements of physiology and hygiene as a part of their education, how often they are unwittingly responsible for the sufferings of their offspring. The bread of our Anglo-Saxon progenitors was prepared of crushed meal, in which the husk and the flour were mixed up together, so that all the necessary constituents for tissue-formation were retained, with such results as those to which I have alluded. The pregnant mother should be enjoined to make use of food containing an excess of nitrogenous material, so as to counter-balance the extra demands upon her blood for those inorganic particles which are necessary to build up the framework of her child. The child being born,—and it is after birth that the greater portion of the bony framework is deposited,—its digestion and its powers of assimilation

must be carefully considered in determining the character of its food; whilst, in later years, it should be amply supplied with ossific material, such as eggs and potatoes, and, above all, if its assimilative powers be intact, bread made with the bran. But the treatment of the child ought to commence with that of the parent during pregnancy; and, to make her submit to this, she must be taught the responsibility which her condition imposes upon her in regard to the welfare of future generations. Could this be done, in a generation or two many constitutional defects might be blotted out, and notably diseases like rickets, scrofula, and caries. I have had the good fortune to have some few children under my care from early childhood; and, by judicious attention to their digestive and assimilative powers, I have been enabled to arrest those ravages which, I am convinced, would otherwise have maintained their sway until nearly every tooth had been destroyed.

Let me next consider the subject of teething, a period so fraught with danger to the child that no less than five per cent. of the deaths under one year, and seven per cent. of the deaths between that period and three years, are ascribed to dentition. At this epoch, when the spinal predominates over the cerebral system, the slightest sources of irritation may lead to fatal results; for that which causes a shudder in a man may produce a convulsion in the infant. The symptoms of dental irritation may be confounded with congestion or inflammation of the brain and its membranes, and in some cases a mistaken diagnosis might be of serious import. Whilst cursorily alluding to the maladies which are dependent upon, or synchronous with, the eruptive stage, I cannot but draw your attention to the empiricism often exhibited in lancing the gums, that favorite method of treatment for actual or supposed dental irritation. There is little doubt that the gums are not only lanced during those periods of repose which characterize evolution, or when the osseous structure of the maxilla still remains unabsorbed over the advancing tooth, but that, as a rule, this operation is performed simply because, in a few cases, the relief of tension in congested tissue has sufficed to relieve an attack of convulsions. Where the tooth is just beneath the gum, or where there is manifest congestion, the incision of the parts may be productive of much benefit, but otherwise it is a procedure not only useless, but barbaric. Retardation in development of the teeth is also a means of indicating future disease; for example, when their eruption is delayed beyond nine months, there is every reason to suspect that the child is suffering from rickets, a valuable means of diagnosing that disease for which we are indebted to Sir William Jenner. Next I must mention some of those diseases connected with the teeth which characterize a later period in life, than which none is of greater importance to the practitioner than neuralgia. If you will recall to mind the extensive sympathetic connections of the trigeminal or fifth nerve, it will not seem strange to you that the teeth should be often connected with reflex phenomena leading to simple spasm, neuralgic pain, or even epilepsy, whilst, in nine cases out of ten in which neuralgia attacks the upper extremity, a dental lesion will be found to be the exciting cause of irritation. This disease has the epithet "idiopathic" far too often applied to it; for in nearly every case a cause exists, though it may be concealed from us, whether it has its origin in the filament of nerve insnared by cicatrix, in a hidden splinter, or a lurking parasite. Doubtless you are all familiar with a case quoted

by Sir Thomas Watson of a well-known physician who was forced to relinquish an extensive practice and a distinguished position through the terrible agonies he suffered as a consequence of *tic-douloureux*. Every remedy was tried in vain, until death revealed the cause, which existed in a small osseous excrescence upon the falciform process of the *dura mater*. If I could lay down an axiom with regard to the treatment of neuralgia, it would be, "Never rest until you have found the cause;" for it will often discover itself when least expected.

[Mr. Cartwright here related a case under his care, in which he found severe neuralgia of the parts supplied by the cervical and brachial plexuses to be due to the presence of a small piece of glass in a swelling over the third phalanx of the second finger of the right hand; the removal of which permanently cured the neuralgia.]

Like sources of irritation exist very frequently in diseased or abnormal conditions of the structure of the teeth, and my experience teaches me that this is a fact not sufficiently appreciated by medical men. The ordinary treatment of neuralgia is far too often empirical. One specific is tried after another with varying success, until all fail, whilst the oral cavity, so rich in explanations of reflex pain, is quite forgotten or overlooked. Caries is by no means the most frequent source of neural pain; for it is often to be found in exostosed cementum, or as a result of secondary dentine formed within the pulp; whilst, yet again, an osseous excrescence growing from the dentinal wall may, by its pressure on the nerve, be an exciting cause, as in the case of this beautiful and unique specimen prepared and kindly lent to me with others by Mr. Saiter. It is sometimes difficult to discover the offending member; but a gentle tap, the alternate use of hot and cold water, or, if the pulp be sphacelated in a non-carious tooth, the appearance of opacity on exposure to a strong light, will make the culprit doff its disguise, and reveal a traitor in the camp.

Among my notes I have recorded the case of another patient who had long been the subject of intractable neuralgia in the head and face. She had been in the hands of celebrated physicians, of quacks, of homœopaths and hydropaths, but with no relief. The pain invariably had its origin on the left side of the face, just over the malar bone. On examination, all her teeth seemed perfectly sound, and the tests mentioned above suggested no intimation of disease. One day, knowing my suspicions that the teeth might be the source of her trouble, she told me that she had an "undefined sensation" in one of the teeth, but she could not point out whether it was the canine or the bicuspid on the left side of the superior maxilla; but the renewal of the tests gave no sign of pain. After various experiments, I resorted to the use of a galvanic current, which made her say that she was certain that the canine was the tooth which had a different feeling from the others. Warned that the loss of the tooth would very probably not effect a cure, she begged me to extract it on the chance of relief being afforded thereby. I did so; and, if you will examine this preparation of the tooth under the microscope, you will see that the cause existed in an almost total ossification of the pulp. After a week, her pain entirely ceased, and not long since she described herself to me as sitting at an open window on a cold day at the seaside,—a thing which she had not dared to do for several years. Of such cases I have seen many; and the immediate relief which occurs upon the removal of the exciting

cause of pain makes me somewhat question the correctness of the late Dr. Anstie's view in relation to neuralgia, that the seat of pain is invariably situated in the posterior roots of the spinal nerves, and that an essential condition of the tissue of those roots is atrophy. Then, various diseases of the ear, the nose, and antrum, and even amaurosis, have had their origin in diseased conditions of the teeth, so that an oversight as to the source of mischief might lead to the loss or impairment of the functions of at least three of the organs of special sense. Mr. Hancock, of Charing Cross Hospital, mentions a very remarkable case of amaurosis dependent upon nothing more than an overcrowded condition of the teeth. Four of these were removed with such good effect, that the sight, which was nearly entirely lost, improved at once, and was again perfect within ten days. I could quote many similar cases, many of which have occurred in my father's practice, some few in my own, but would refer all of you who are interested in the subject to Mr. Salter's valuable work on "Dental Pathology and Surgery."

It must not be forgotten that the teeth are not only the sources of, but that they are not unfrequently the objects of, sympathetic irritation themselves, and have, doubtless, in the absence of adequate knowledge as to the cause of pain, been often condemned for the faults of other members, like certain unfortunate officers in a recent naval inquiry. Thus I have frequently seen a constipated condition of the bowels induce pain in the teeth; and in another case an attack of gout is always ushered in by intense dental suffering, which a dose of colchicum relieves at once; whilst I have long had a patient under my observation who, suffering from hemorrhoids, always has acute pain in his upper molar teeth when these become congested, which invariably ceases when an attack of hemorrhage relieves the engorged vessels. Many of the tumors which afflict the maxillæ have their origin in a diseased root or an impacted tooth, these varying from the simple abscess to the cyst or odontome, in which latter tumor an appreciation of its character renders its removal the simplest of operations. A swelling occurring in connection with the unexplained absence of a member of the normal dental series should always suggest a hint in such cases, and it will be found that this class of tumor is invariably encysted, so that the removal of a little superficial bone will permit these growths to be enucleated with little loss of tissue.

Again, in a very large proportion of examples of abscess or neuroses connected with the maxillæ a local source of irritation exists, such as may be found in a wisdom-tooth attempting fruitlessly to take its position where there is want of space, or, more often still, in the remnant of a fang over which the gum has grown. Such errors in diagnosis are frequently made with regard to patients of strumous and scrofulous diathesis, in whom the history of the case and the swollen glands too frequently mislead the unwary practitioner. Wherever there are sinuses in connection with the glands about the jaw, search for an errant root. You may have much trouble in discovering it; but, if you be successful, its removal will not only instantly cure the patient, but prevent that terrible disfigurement which is a result of abscesses in this position. I have witnessed the cure of long-standing suppuration diagnosed as scrofulous again and again by the extraction of a root, the presence of which was unsuspected by patient or practitioner.

Finally, every surgeon practicing in the country or abroad, in places

where special aid is not at hand, should be able to arrest pain and disease in the teeth, at least temporarily, whilst he should have some knowledge of the treatment of the milk-teeth, which he is often called upon to remove; indeed, with regard to the latter subject, his appreciation of the simple rule, never to remove a temporary posterior molar or canine without urgent reason, would alone prevent many subsequent deformities of the permanent denture.

Think how many teeth might be saved by the aid of a little special knowledge concerning their diseases. Such knowledge would be useful to all, but especially to those who are about to devote themselves to the preservation of the health of those who maintain England's glory and good name *per mare, per terras*. The agony which I have seen soldiers, and especially sailors, suffer from their teeth has been terrible, and in too many cases without a chance of satisfactory aid, unless it be by the extraction of the offending organs. By such unnecessary losses men are incapacitated before their time, and it is from a feeling of pure humanity that I would insist upon the necessity of army and naval officers devoting a short period to the study of diseases of the teeth, thereby arming themselves with another weapon with which to combat pain and suffering. In future lectures, I shall hope to have opportunities of showing you examples of those direct and indirect results of dental lesion to which I have alluded to-day, whilst I shall especially demonstrate to you those operations necessary to alleviate pain or to arrest disease, whether temporarily or permanently, by more complicated means. My task will be a labor of love, if I can impress upon you the importance of my subject when considered in its highest *rapports*; whilst I shall feel that, in disseminating among you what little knowledge I possess, I shall be contributing in some small way towards the lightening of those burdens and the assuagement of those many ills to which flesh is heir.—*Hamilton Cartwright, M.R.C.S., at King's College, London; British Medical Journal.*

OSTEO-SARCOMA OF THE SUPERIOR MAXILLA.—Mr. Marsh exhibited the upper jaw of a boy of fourteen, which was removed by operation for a tumor of six months' growth. The principal sign of the disease was swelling of the face above the bicuspid; there never was pain: the growth encroached somewhat on the cavity of the nose, but neither on the palate nor backwards. It was first punctured, and the bone was then removed entire. The boy rose on the fourth day. The tumor proved to be an osteo-sarcoma. The diagnosis was interesting in the presence of swelling only. Mr. Marsh had had another case somewhat similar lately, where the tumor grew from the antrum, and was removed by simple scooping. It had not returned, although the operation was performed nine months ago.—*Pathological Society of London Reports, in Medical Times and Gazette.*

TUBERCULAR LUPUS OF THE TONGUE AND MOUTH.—Mr. Fairlie Clarke showed this specimen, which was taken *post-mortem* from the body of a patient of Mr. Teevan's. The disease involved the tongue, soft palate, and gums. A bricklayer of eighteen, without any history of phthisis, cancer, or syphilis, personal or family, had suffered from the disease for five months at least. The whole of the oral mucous membrane was velvety, thickened, and infiltrated. The side of the tongue and the gums were ulcerated, and the whole of the soft palate was gone. Sir James

Paget diagnosed the disease tubercular lupus during life. The salivary glands were enlarged, but not the lymphatics. Microscopically, the interstices of the connective tissue were found infiltrated with small round cells. The skin was everywhere sound. Mr. Clarke said that primary lupus of the mucous membranes was rare, and tubercular lupus of the tongue very rare.—*Pathological Society of London Reports, in Medical Times and Gazette.*

HEMORRHAGE FROM THE GUMS.—TREATMENT BY ELECTROLYSIS.—For two years a lady of middle life, a distinguished actress, had been annoyed by repeated and oft-occurring hemorrhages from the gums of the upper jaw. The blood came from the gums just behind the incisor teeth, and it was impossible to tell the precise point of exit. There was no swelling, no ulceration, no inflammation or congestion, at ordinary times; indeed, there was nothing to distinguish that portion of the gum from any other portion, or from the gum of a person in health. At times there would be a fullness, a filling up, so to speak, of that portion of the gum, and the blood would flow freely. This accident would occur at any time of the day, but quite regularly in the morning. One time she was taken while acting before an audience. The amount of blood lost at each hemorrhage was considerable, varying from a half an ounce to a wineglassful, but the local remedies that had been tried, including, of course, the persulphate of iron, made no permanent impression. The patient was generally debilitated and was suffering from hepatic disorder, and her debility was increased by the frequent losses of blood.

I decided to use electrolysis, although I knew not just where to put the needles; but hoped that the coagulating effect of both poles on the capillaries of the gums might have a tendency to diminish, if not to stop, these hemorrhages.

Being a lady of very great power of will, and somewhat fearing ether, the operation was performed without an anæsthetic. A small needle, connected with the positive pole, was inserted about one-eighth of an inch into the gum just between the incisor teeth, and another small needle, connected with the negative pole, was inserted the same distance into the gum near by. A very mild current was used, for this part is sensitive to electricity as to every other form of irritation. The operation lasted but seven minutes, and was twice interrupted on account of the pain produced.

For a week after this operation there was no hemorrhage; electrolysis had thus accomplished more than any treatment that had been used.

March 12th. The operation was repeated with a somewhat stronger current and longer application.

In a few weeks the patient died from, as it was reported, disease of the liver.—*George M. Beard, M.D., in The Medical Record.*

HOW TO PREVENT CHLOROFORM-ASPHYXIA—Dr. J. Fleiberg's (*Berl. Klin. Wochenschr.*, Sept., 1875) plan is to dislocate the inferior maxillary bone forward whenever any asphyxial symptoms make their appearance. The best way of producing this dislocation is to stand behind the reclining patient, put both thumbs behind the symphysis and the index-fingers on the posterior edges of the rami of the bone, then grasp the maxilla firmly and drag it directly forward. If the

patient be under the influence of the anæsthetic—and then only it is necessary to resort to this procedure—the condyle will move forward with a perceptible motion and the entire bone is displaced. As soon as this is done the patient takes a long breath and respiration proceeds without any further difficulty as long as the parts remain in the same position. The author has employed this procedure in more than a thousand instances, and has never failed to achieve the desired purpose, namely, the use of chloroform without any unpleasant complications. He believes that the root of the tongue and the epiglottis are dragged forward, and thereby the occlusion of the larynx and the consequent asphyxia, which is due to the weight of the tongue, are obviated.

The same method has been in constant use by Esmarch since 1866; and Langenbeck employed it constantly during the late Franco-German war, and never lost a case from the effects of chloroform.—*Chicago Medical Journal and Examiner*.

SURGICAL ANÆSTHESIA IN CHILDREN.—This is the method of procedure at the Hôpital des Enfants Malades: At eight o'clock the sister administers from three to four grammes (according to the age of the child) of chloral, and the child goes to sleep in twenty minutes. At nine o'clock the dentist passes through the ward and pulls the tooth, at times two teeth, and when the child wakes up, after three or four hours, it is minus its tooth, without suffering, or having seen the dentist.

Those who know the pain of having a tooth pulled, and the difficulty of doing this in children, will appreciate in chloral a precious agent.—*Bull. Gén. de Thérapeutique*.

THE ANTI-NEURALGIC PROPERTIES OF THE ESSENCE OF MINT.—In a paper read before the Société de Thérapeutique (reported in *The Practitioner*, from *Gaz. Méd. de Paris*), M. Delieux de Savignac points out that the essence of mint exerts a special influence on the sensory nerves, which diminishes the abnormal vivacity of their reactions when these become exalted into painful affections. It is incomparable in this respect to chloroform, ether, and camphor. Though its high price will prevent its being extensively used in the pure state as an anti-neuralgic and anti-rheumatic, it may be employed in alcohol solution as an application in the form of liniment, and camphor, chloroform, and laudanum may be added to it with advantage in various cases. . . . Neuralgias of the head and face are best treated by making a small ball of wool of the size of a nut which has been made to imbibe a few drops of the essence, and rubbing the painful part with it gently. It is then to be covered with a larger piece of wool, and the whole kept in position for a few minutes with the palm of the hand. The success of these external applications of the essence of mint in neuralgias of the head and face, and even in cases of congestive cephalalgia, has been both prompt and permanent. He adds, however, that the cause of the pain must be local for the cure to be permanent, since, if it be dependent on hysteria, or be connected with intermittent fever, or with gastric derangement, the primary cause must first be removed.—*Pharmaceutical Gazette*.

A CASE IN PRACTICE.—Miss B——, aged fourteen, was brought to me with a superior central incisor all but out, and lip much swollen from a blow with a walking-stick, by her brother during play. The tooth, when pressed into its socket, came down again in a few seconds.

Attempts to tie it up were attended with much pain, and failed completely. The following plan was then adopted: A narrow ring, cut from thick rubber tubing, about a quarter of an inch in diameter, was tied in two places to form three loops. The middle loop, to be passed on the tooth, was made so as to form two segments of a circle. The smaller segment was placed at the back of the tooth, for the sake of obtaining greater traction by the side loops, which rested on the next teeth in front. The tooth at once passed up, remained in its proper position, and, as soon as the inflammation had subsided, became firm and comfortable. This ready mode will, probably, be applicable for two or more adjoining teeth accidentally extruded or dislodged.—*C. J. Peacock, in Monthly Review of Dental Surgery.*

A THIRD DENTITION AT THE AGE OF SEVENTY-THREE.—M. Echerac relates in the *Gazette des Hôpitaux* (October 9th) the remarkable case of an old gentleman, aged seventy-three, who, after the manifestations of nervous symptoms for some time, and an abundant salivation, exhibited in his upper jaw, which had long been dismantled of teeth, some fine ones projecting about two millimeters beyond the edge of the gums. They were six in number—four incisors, one canine, and one small molar. These teeth were neither very white nor very strong, but formed an excellent substitute for those lost. Van Helmont relates a precisely similar case occurring at the same age.—*Medical Times and Gazette.*

THE ACTION OF SALIVA (*The Doctor*, October 1st, 1875).—M. Petit recently communicated to the Société de Pharmacie de Paris the result of his experiments upon saliva. He had found that one gramme of ptyalin had the power of dissolving from ten thousand to twenty thousand grammes of starch, producing a quantity of sugar varying between three thousand five hundred and seven thousand grammes.—*Philada. Medical Times.*

CARIOUS TEETH.—Dr. Lardier advises, in *L'Union Médicale*, to drop some collodion into carious teeth, after the latter have been cleaned and dried. The liquid collodion exactly fills the cavity of the tooth; the ether evaporates, and narcotizes the nervous twigs. By solidifying, the collodion protects the tooth from the contact of the air. Dr. Lardier states that he has thus succeeded in relieving many patients.—*Medical and Surgical Reporter.*

CEMENT.—A cement capable of being used where resistance to both the action of water and the action of heat is required is composed by mixing glycerin with dry litharge, so as to constitute a tough paste. For uniting the joints of steam-pipes, and other similar applications, this preparation is said to be very satisfactory.—*Pharmaceutical Gazette.*

TO CEMENT WOOD AND IRON.—Iron may be cemented in wood by dropping in the recess prepared in the latter a small quantity of a strong solution of sal ammoniac. This causes the iron to rust, rendering it very difficult to extract.—*Scientific American.*

A NEW MUCILAGE.—The *Journal de Pharmacie* states that if to a strong solution of gum-arabic, measuring $8\frac{1}{8}$ fluidounces, a solution of 30 grains of sulphate of aluminium dissolved in two-thirds of an ounce of water be added, a very strong mucilage is formed capable of fastening wood together, or of mending porcelain or glass.—*Scientific American.*

HINTS AND QUERIES.

REPLY TO "SUBSCRIBER," IN JANUARY DENTAL COSMOS.—Take a sharp plaster impression. Examine the central portion of the arch always. In many mouths there seems to be an entire absence of soft tissue in this part,—not the slightest "give" to it in fact,—simply a hard, unyielding surface. In such cases, relieve the impression as far as this surface extends, so that the bearing of the plate will be upon the soft parts.

Don't put in an air-chamber. Let this be a law unto you, and abide by it now, henceforth, and forever.

The teeth should be so arranged that, at each occlusion of the jaws, the bicuspids and molars on each side shall "strike" together; the anterior teeth not at all.

There is no need of instructing a patient to exhaust the air, for if the adaptation of the plate to the gums is perfect, the moment it is inserted the air is exhausted thereby, and the principle of atmospheric pressure applies itself.

If these points are carefully observed I see no reason why "Subscriber's" failure may not be turned into a success, which should answer the purpose of mastication certainly, and, in addition, allow the wearer the privilege of a glorious sneeze, a violent cough, or a roaring laugh, as he chooses.—W. A. BARROWS, D.D.S., *Buffalo, New York.*

REPLY TO E., IN JANUARY NUMBER OF THE DENTAL COSMOS.—I would suggest that E.—who reports the case of diseased gums on page 51 of "Hints and Queries"—apply carvacrol in *full strength* to the gums with a camel's-hair brush, or by any means involving delicacy as to touch and quantity, repeating the treatment as often as indications may require, and, if successful, report results. The moisture should be absorbed from the surface of the gums before making the application.—H. L. S.

THIRD DENTITION.—In June last a lady of forty requested me to extract what she called a root the point of which was just visible. I extracted it, and, to her astonishment, it proved to be a fully-developed and perfectly-sound canine. She had worn a full set of artificial teeth for a year.

I have a patient thirteen years old who has but six teeth. Can anything be done in the way of diet or medicine to promote the growth of more teeth? The child is healthy, but of slight frame.—L. H. JENKS, *Barnston, P. Q., Canada.*

NOTES AND NOTE-BOOKS.—In the articles on "Dental Pathology and Therapeutics," now in course of publication in the DENTAL COSMOS, there is shown by their author an exactness that must come of note-books well kept, as much as from a certain quality of mind. The details brought out and thoroughly worked up in this series of communications must have been recorded on the spur of the moment, and in such a manner as to enable their author to readily call them to mind, not only for their present purpose, but for use in his office. How did he do it? What books did he use? How did he use them? Hundreds of us are seeing things every day in the office and out of it, but which, no matter how valuable, will, in a week or two, become useless, simply because they are not recorded at all, or not recorded properly.

The author above alluded to will confer a great favor not only upon the present querist, but upon other members of the profession in a like strait, if he will give a reply, with illustrations.

The writer hereof takes notes,—many of them, too,—but has never been satisfied with his method: it is clumsy, and the notes are not easy to make use of.—**XERNES.**

WAX BASE PLATES.—I give herewith my method of making base plates. Fill a four-quart tin pail two-thirds with boiling water; set it on the stove; put in scrap wax; when melted, stir, that all the dirt may settle; fill a quart bottle with cold water; soap the bottle; then dip in the old-fashioned way of making candles; withdraw and dip again until the wax on the bottle is the required thickness; with a knife, split down the side and remove; soap and dip again. I can make sheet-wax enough in half an hour to last me a year.—**W. W. BLACKMAN.**

A NEW USE FOR CELLULOID.—I do not claim this as being entirely new, but I never heard of its use before I commenced it, nearly two years since. Dissolve celluloid in ether to the thickness of cream, and carry to the point of exposure, or cover the entire cavity, and evaporate the ether with the air-syringe. It makes a nice artificial skin (a non-conductor) covering the cavity. Previous to the application of the celluloid, I touch the exposure with carbolic acid or creasote, and fill with any of the temporary fillings in use. I have found Hill's stopping preferable to any other. I do not remember one case of inflammation which has resulted from exposure since I have been using the celluloid covering.—**FRANK L. HARRIS.**

CAPPING EXPOSED PULPS.—If Dr. Douglass will try the following plan for capping exposed pulps, he will find it more easily done, and the proportion of *saved* pulps to those treated very much increased:

Thoroughly prepare your cavity, using a *solution* of creasote or carbolic acid for a wounded pulp; then cap with oxide of zinc, mixed with ether, and solution of carbolic acid (equal parts), the solution of carbolic acid about in the proportion of one fluidrachm to four fluidounces of water; place immediately over the exposed point, and cover this with oxychloride of zinc. When hard, fill with gold; or, which is better, use Fletcher's preparation for capping pulps, which, by evaporation of some of the fluid constituents, I think, hardens so as to retain its place, and is sufficiently a non-conductor of heat and cold as to allow the gold immediately in contact with it and not be affected by ordinary thermal changes. Fifteen months is hardly time enough to judge of the success or failure of a new mode of practice. However, this mode of placing gold over an exposed pulp is neither new nor successful, and has failed in the hands of some of our best practitioners years ago.

The idea that oxychloride of zinc is a non-conductor of heat or cold is a fallacious one, and may lead the inexperienced into trouble.

Will some one who knows tell us of what the liquid part of Fletcher's preparation is composed? as a knowledge of that would help us to judge of its effects on the pulp. It has been so useful in my hands that I want to know more about it.—**M. C. S.**

NEURALGIA CAUSED BY THE MALPOSITION OF A WISDOM-TOOTH.—A lady patient about thirty years of age, in good health, about three months advanced in pregnancy, and suffering very much from facial neuralgia, applied to me recently for relief. A bicuspid and molar on the left side—lower jaw being broken down beyond hope of restoration—were extracted, with some temporary relief; but in a few days the pain returned with great severity, and seemed

located on the right side of the lower jaw. The second molar on that side being badly decayed, I extracted it. Upon examination, I found a considerable portion of the roots had been absorbed, and, searching for the cause, found it in the presence of the crown of the wisdom-tooth, which, having lost its way, was trying to erupt through the second molar. It had forced its way between the roots, causing their absorption, and had almost penetrated the pulp-cavity. It was shaped very much like a bicuspid, and its spear-shaped crown was well adapted to lead the way. Query.—If the second molar had been sound, how could I have diagnosed the cause of the neuralgia?—A. H. C. JEWETT, *Laconia, N. H.*

ON WORKING TUBE-TEETH.—It is somewhat remarkable that while English dentists have for many years used tube-teeth so generally that the form and merits of this pattern must be familiar to dentists all over the world, still, there are many practitioners in the States, and in foreign cities, who do not understand the simple process by which these teeth are fixed.

It has happened in the writer's experience some half-dozen times that English patients, traveling abroad, and meeting with some trifling accident to their "grinders," have been unable to have them properly repaired owing to this cause. In making a case with tube-teeth, the plate being fitted, clasps on, etc., the teeth are, first of all, "roughed down," so as to approximate somewhat to the form of the ridge on which they are to stand. This may be done with the back of an old file and the lathe. Then, holding the tooth in position with the left hand, a fine broach is passed down the platina tube in center of tooth, and, with the point of the broach, a mark is made on the plate, indicating the position for the pin. The tooth being removed, a hole is drilled through the plate, with a drill nearly the size of the wire of which the pin is made. This hole can then be slightly enlarged with a broach, and the direction of the pin provided for, whether backwards or forwards, etc. A piece of wire about the length of the tooth is then cut, the end to be inserted in the plate filed to five sides (this facilitates the flow of the solder), and soldered in. The case is now ready for fine fitting. By aid of a little color on the plate around the base of the pin, the tooth, being slipped on and off, can be fitted as accurately as possible. It is of course needful to keep the tube quite free, or the tooth may be split. When all is complete, the tube being thoroughly clean, and the pin slightly roughened, they are united by a small quantity of *stick sulphur*, broken up into small lumps. Gently heating the plate over a spirit-lamp, a lump of sulphur is placed on the top of each tube, which, as it melts, runs down between the tube and the pin, and soft-solders the whole joint. It is well to move the plate to and fro over the lamp,—not to let it get too hot,—and to keep the lump of sulphur renewed, so as to prevent its running through too fast.

In removing these teeth for repair, we first wash the case with soap and water to remove all food and grease; then gently warm it up, holding the plate with a pliers over the lamp, and, as the sulphur gradually begins to melt, the teeth will easily slip off the pins. This must be done before any hard-soldering is attempted, as tube-teeth are not supposed to "stand fire." After the repair is completed, and before resetting the teeth, it is desirable to scrape off and clear out all the old bits of sulphur, as they are apt to catch fire, and the stain is not easily removed. The process is exceedingly simple, and may appear hardly worth so many words; but the information will perhaps be of service to some readers of the *DENTAL COSMOS*, and possibly enable them some day to relieve the sorrows of an unfortunate wayfarer with ease to themselves and comfort to the patient.—W. H. WAITE, D.D.S., *Liverpool.*

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, APRIL, 1876.

No. 4.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

(Continued from page 117.)

[Entered according to act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the Office of the Librarian of Congress at Washington.]

Sanguo-nervous.—Step by step in the temperamental scale we shall now find doubt and difficulty increasing; with every change in physical attributes we must expect to discover more need for care, a wider field for thought, a better judgment requisite, and, as the questionable reward for the bestowal of all this, will have to accept a lessened average of success.

But it is also a pleasing reflection that the resources of our profession afford us so much in the direction of therapeutic application, in combination with manipulative skill, that, even when life and death seem so evenly balanced, we can, with tolerable frequency, insure the desired result.

The signs of the *sanguo-nervous* temperament are, less than average size,—decidedly less than average osseous, muscular, and contour development; hair light and curly, of fine quality, but generally decided inclination to baldness; forehead high, full, and broad in proportion to the rest of the face; eyebrows light and arched; beard scanty but pleasing, both in quality and length; eyes blue or gray, full, inclined to large, and expressive; mouth average; lips full; nose thin, prominent, and shapely; cheeks high and prominent; lower face inclined to thin; chin small and round; skin fair and smooth, with fine color tints; special senses acute.

In this combination we have, in disease, to contend with the basal attributes of quickness, tissue-irritability, and acute perception of abnormality, modified by a circulatory impulse sustained by hopefulness instead of solid strength.

In health, we find that this combination makes constant draft upon nerve energy, without any enduring basis upon which to rely for this extraordinary exertion, and thus, while for a time the supply may seem equal to the demand, it will be proven by later experience that exhaustion will be alike sudden and complete, while in relative proportion recuperation will be incomplete and *insecure*, though sometimes apparently rapid.

Just in like manner pulps will act,—hastily and earnestly coming to the rescue at the signal of distress,—seconding, *apparently* with marked ability, any efforts which may be extended in their favor, and giving much promise of continued exertion; but, unless it is possible in any given instance to relieve with promptness *and maintain relief*, the time will come sooner or later when all this will cease, and, with a few struggles for peaceful existence, the pulp will yield to paroxysmal suffering, and eventually die.

It is, however, usually the case that concomitant with congestion of the bulbous portion of the organ a degree of pain accompanies the consecutive devitalization of the canal portions, which, together with the possible tenderness of the tooth upon occlusion due to altered nerve action in tissue about the ends of the roots, will demand the attention of the dentist.

If this unfavorable termination is comparatively prompt in its accession, it is usually accompanied by an amount of suffering which necessitates immediate relief; but if this does not supervene for many months, or, more markedly, if not for several years, the process of pulp-devitalization progresses with such gradual abandonment of life as sometimes to do nothing more than give the patient gentle warning that something “not right” is going on.

Lymphatico-nervous.—Again we have another step downward, as with this temperament we close the “doubtful and anxious” third class.

The signs which pertain are, average size,—less than average osseous and muscular, but more than average contour development; hair medium in color, but straight, or, at most, slightly wavy; eyebrows not marked nor arched; beard sometimes almost wanting, with the frequent peculiarity of high-pitched voice; eyes from dark gray to light gray (modification of this temperament will sometimes produce the apparent anomalies of dark hair with very light eyes, and of light flaxen hair with very black and pleasing eyes); mouth large; lips full, with quickness of motion, but complete absence of decision or firmness; cheeks inclined to full, but flat and not firm; skin either darkish or lightish, but generally devoid of freshness and color, especially after young life; special senses apparently acute, but really devoid of correctness of perception.

It is important to recognize in connection with this temperament

that, while we find it the least promising of its class, we at the same time have increasing likelihood for the presentation of "almost-exposed pulps."

This result ensues from the *basal* tooth attributes of only comparative density of structure, which, with good organization, lacks solidity, together with that delicacy of form which gives length rather than breadth, and this *modified* by the lymphatic control, which detracts still more from both density and strength.

Like teeth, like pulps; and thus, with the presence of a certain degree of nervous irritability, but with the absence of strength, either organic or circulatory, they fail alike in giving that proper warning of danger which would make possible a timely interference, and in rendering efficient support when at last help has been afforded.

4. *Bilio-lymphatic*.—This temperament is the first of that last class which I have characterized as eminently unsatisfactory.

It is a curious mixture, of weakness trying to be strong; of vacillation trying to be decided; of softness trying to be solid; of *inertia* trying to be *momentum*!

Its signs are, decidedly more than average size, but with largeness of development, neither beauty of form nor strength of structure; hair dark, moist, and straight, generally in good quantity, but lacking in quality; eyebrows marked; beard moderately heavy, dark and straight; eyes dark gray to quite dark, moderately large, but wanting in expression and power; mouth large; lips full and bluish or brownish-pink in color; nose large, full, and broad; cheeks large, but not prominent; skin dark, pallid, and opaque; special senses dull.

The teeth of this temperament are an equally singular compound of external strength and internal weakness; of size sufficient for great work, but of structure almost worthless; of good color and polish, but of suspicious opacity.

The pulps are the fitting producers of this anomalous result, and are markedly typical of individual peculiarities: pretending, but not possessing; promising, but not performing; even *intending*, but not doing.

These are the pulps which will only give the usual indications of irritability from deepness of decay, when upon examination they will prove to be almost completely exposed; these are the pulps which will give no sign in connection with large cavities of decay, until only a partial preparation will be sufficient to demonstrate complete exposure; these are the pulps which will remain quiescent, comfortably assuring both patient and practitioner that all is *going* well, until through some other avenue it is announced that all has *gone* badly; these are the pulps that will annoy by doing everything that is unexpected and undesirable, even to remaining provokingly quiet when any respectably-disposed pulp would ache; and contrariwise, aching persistently, as

repeated applications, even of arsenious acid, have failed to produce sufficient response to accomplish devitalization.

It is for these reasons that I esteem them as eminently unsatisfactory, and for these reasons I shall, in place, indicate a peculiarly tentative treatment as appropriate for such almost-exposed pulps.

Nervo-lymphatic.—This last of the dento-temperamental group is almost hopeless for pulp-conservation.

The characteristic individual of this unfortunate combination possesses almost every attribute which will insure trials and troubles, and few indeed which can be so managed as to afford even a trifling amount of comfort. Receiving nothing of strength, nothing of endurance, nothing of force from bilious admixture, and nothing of beauty, nothing of true genial vivacity, nothing of high and hopeful aspiration from the sanguine, the lymphatic base is, by nervous modification, rendered irritable in its imbecility, rapidly vacillating in its attempted stability, and quickly impetuous in its impotency.

Doubtful of everything worthy of confidence, having apparent faith in statements which are palpably unreliable, even to absurdity, there is no foundation upon which to establish desirable professional relations. Incapable of correct understanding, ever ready for misapprehension, misconstruction, and misrepresentation, it is simply a waste of power to endeavor to maintain such intercourse with patients of this temperament as one with moderate tact can easily do with nearly all the rest of the human family.

The signs of the *nervo-lymphatic* temperament are, average size, usually with average development; hair straight and medium in color; eyebrows marked and arched; beard straight and of medium quantity and quality; eyes grayish, inclining either to green or hazel, of medium size, but possessed of a peculiar quick, restless movement. The *appearance* of the eyes, and the *size* of the body, limbs, and head of an individual of this temperament, would naturally suggest a muscular motion, deliberate, if not sluggish. It is, then, the distinctive feature of a seemingly anomalous, startlingly-quick response to any call for action upon the part of such a person which markedly attracts the attention, and classifies the actor as *nervo-lymphatic*.

Just as these ordinarily placid eyes move up and down, and from side to side, in anxious and suspicious search; just as these large, soft limbs and heavy bodies start, almost convulsively, at any slight demand, so do the pulps of *nervo-lymphatic* teeth make quick and irritable response at any trifling provocation, and, almost always, bid defiance to all attempt at palliation, when from the force of untoward circumstances they have become "almost exposed."

It is sometimes the case that by the exercise of careful skill, together with the accurate employment of one or more of our most noted pain-

obtunders, success is the temporary reward of our endeavors; but, even when by several days of quiet we have been tempted to appoint a time for the completion of the operation, we are quite frequently disappointed and chagrined at finding everything as painful as at first; or else, when this does not occur, and "quiet" is continued for sufficient time to allow of reasonable hope for future comfort, a period of time varying from a week or two to a month or more will sometimes intervene, when finally, with a start characteristically *nervo-lymphatic*, paroxysm after paroxysm of pain, as anomalously intense as the muscular motions are convulsive, will quickly lead to efforts for pulp-devitalization, and these, possibly, to summary extraction.

Physical condition.—This third consideration is one which must be recognized as exerting a most decided influence over the result of every effort at conservation of the vitality of an almost-exposed pulp. So very important is the relation of this to the experiment in progress that I feel I cannot too strongly impress the fact.

The very best temperamental attributes may be rendered almost without value by an existing state of typhoid; and, on the contrary, pulps which rank low in the temperamental scale may respond most satisfactorily to treatment when their possessors are in the enjoyment of excellent physical condition. But it does not need the extremes of typhoid and excellence to have marked agency for good or for bad, for it will be found that any demand for an amount of exertion which produces a more or less continuous state of *fatigue* will be equally more or less detrimental to the adequate pulp effort.

It will be remembered that when upon causes of dental caries, I alluded to the notable influence of "tire"; and that I also directed attention to the evident abandonment of such non-essentials to the continuance of vitality as the teeth and hair when, from over-exertion, the demands of the economy exceeded the possibility of full recuperative effort in every organ and tissue.

As with dentine, so it is with the organ which produces and conserves dentine, and thus no greater deviation from normality than that of chronic fatigue renders the dental pulps unable to do more than maintain a tired existence. Having but little and insufficient strength to spare toward the nourishment, while it is itself in turn protected by that tissue in its normal quantity, it can be expected to do but little toward conserving its own vitality when it is deprived by caries of nearly all its natural covering.

The best that skill can do is to preclude, by artificial means, the further immediate progress of decay, and the continuance of such *outside* irritation as has resulted from the existing lesion; but with all this there is still the presence of non-vitalized material in close proximity to a tired organ, and though it may be exactly adaptive to contour, and

may not exert pressure and thus irritate; though it may be non-conducting, and so prevent thermal irritation; though it may be imperious, and thus preclude the infiltration of external irritants; though it may to sufficient extent *be pervious*, and thus permit of the escape of such effused fluid as otherwise might be irritative, it nevertheless is not a living, healthy covering, which alone can meet the full demands of such an emergency.

Sex.—Although it might seem that the strength of the male would favor the continuance of vitality in a properly-treated and adequately-protected "almost-exposed pulp," and that the delicacy of female organization would be detrimental to success in like cases, yet this is found in practice *not to be so*.

The average of failure is about the same in both sexes, for the greater exposure and the more violent ordinary exertion of the male seems to counterbalance any advantage he may possess from superior strength; while the greater care of person, together with the usual comparative quiet of domestic employment, will fully compensate for any deficiency of systemic power which may pertain to the female. And yet, *sex* is a consideration which, under certain circumstances, exercises an almost overpowering *adverse* control.

Pregnancy is a systemic state which *seems* to mark the teeth as especial objects for attack. I have already alluded to this when upon caries, and experience will amply prove that the deteriorating influence, of which I have there spoken, does not expend itself upon the external hard tooth-structure, but quite as injuriously affects the dental pulp.

(To be continued.)

THE DYNAMICS OF DENTAL OCCLUSION AND THE STRUCTURAL EXPENDITURE OF THEIR MAINTENANCE.

BY A. H. THOMPSON, D.D.S., TOPEKA, KANSAS.

THE force with which the lower mandible is occluded against the superior maxillaries is, in the average mammiferous animal, probably without parallel in any department of animal mechanics. The principles of construction and motion of the specialized parts devoted to mastication, and the precision and force with which this function is performed in the majority of animals possessing vertical mandibular occlusion, is wonderfully illustrative of the capacity of the animal mechanism for the display of power. The limited amount of tissue of which the apparatus is constructed does not appear capable of the intense manifestations of force demonstrated. No other single part of the animal structure possesses, dynam for dynam, so much power, even

excluding the ratio of size and area; and the capacity exceeds all proportion to the area involved, compared with the average mechanical power of other regions. The arching, the leverage, the static, receiving pillars, and the strong, peculiarly distributed and attached muscular impactors, all quasi-condensed into a comparatively limited area about the cephalic alimentary opening, and located on the antero-inferior aspect of the cranium, contain and expend force greatly in excess of other mechanical regions. Other parts of the organism endowed with equal comparative power would give to the higher mammalia the prodigious comparative strength of the ant. An elephant possessed in all his muscles of the power a gorilla exhibits in his *temporals* and *masseters*, would be mighty beyond conception, and exceed the same bulk of steel for forceful motion.

The maximum of area of the masticatory region is attained by the herbivorous mammalia, where capacity for motion is more essential than for force direct. Trituration is here an important factor of digestion, especially so in the Ruminants. The anatomical factors entering into the structural peculiarities of the masticatory region of animals of this class may be enumerated as follows: (1) the construction of the temporo-maxillary articulation, allowing lateral, antero-posterior, vertical and oblique movements; (2) the extent of maxillary attenuation developed for the support of extensive masticating area; (3) the suppression of density and diameter of the maxillary bones, thus economizing weight and structure; (4) the predominance of the rotatory over the elevating muscles; and (5) the peculiarity of construction of the masticating armature, the teeth,—i.e., the vertico-parallel arrangement of the dental tissues and the abortion of the crushing teeth.

Taking as an opposite example of specialized structure, the Carnivora, we find vertical occluding force paramount, and an inverse condition of things, and correspondingly of structure, in almost every respect: (1) the temporo-maxillary articulation admits of but one variety of movement, vertically, but with increase of extent in this direction (as opposed to limited capacity in this particular in the Ruminants). This vertical motion serves completely the mastication of the food of the Carnivora, which requires merely division, cutting in pieces, and not the elaborate dental manipulation the food of the vegetable-feeders demands; (2) the masticating area is greatly reduced; (3) the maxillary bones possess more density and diameter, being required to resist, and to contain more force. The archings and bracings are peculiarly apparent in the osseous structure; (4) the predominance of the elevating over the rotatory muscles,—the latter, in fact, being utterly useless in the true Carnivora. The occluding muscles are largely and strongly developed, as their extensive attachment impressions on the cranium indicate; (5) the teeth are merely trenchant implements for holding and tearing

prey and dividing food for deglutition. The arrangement of the dental tissues promotes the most complete subservience of duty, the harder element, the enamel, being external.

The comparison between these two classes exhibits many things in support of our argument,—*i.e.*, that the apparatus maintained by the animal economy for the performance of mastication is a costly one. It is exorbitant in its demands upon the developmental and nutritive forces, and where not imperatively needed and employed, the various elements composing the apparatus are in part or whole suppressed or modified by nature for economic reasons. Thus, in the Ruminants the maxillary bones are lighter in structure and less in diameter than in the Carnivora, for the reason that they are not required to sustain and resist the same amount of impact. In the latter class, the extent of maxillary attenuation of the Ruminants is reduced, for the reason that triturating surface is not required.

Passing on to the order *Primates*, in one of the highest species, *Troglodytes gorilla*, we find ample illustration of intensity of development of masticating power and force of dental occlusion. This peculiar capacity has given rise to many and wonderful stories of "our big brother's" feats with his jaws, such as his crushing a musket-barrel with his teeth, etc., which may not be accepted without question. But that he can bite off a man's fingers or hand (which is his adopted mode of attack on his developed kinsman), or crack hard, thick-shelled nuts and crush or break thick limbs of trees, as the acquisition of his food requires, is easily conceivable to an extreme demand, from the extraordinary development of the dental and masticatory apparatus. This powerful and really wonderful dental occlusion of the gorilla is supported by a mechanical combination of ponderous construction for its kind. Many of the *Quadrumana* are well armed by strong, large jaws and teeth, but are surpassed by the gorilla's construction and capacity for force. It is only worth our space to note the immense, dense maxillary bones with their bracing, arching, and pillar system; the formidable dental armature and the powerful muscular development,—all so indicative and suggestive, singly or as a whole, of power. The muscles of elevation and occlusion predominate over everything else in the outline of the head, and subject the entire cranium to their accommodation. The dental apparatus, indeed, so predominates over the other parts of a strong mechanism as to be a hideous deformity, from an artistic view, and bears out the comparison made in other forms as to its comparative superiority in strength and force.

Passing now to Man, we find a great and remarkable reduction of the masticating system. The most important feature distinguishing him from all lower forms is at once apparent,—*i.e.*, the preponderance of the brain-case over the dental apparatus. In the gorilla, the latter

is exaggerated to the suppression of the former, but in man the reverse condition obtains. Instead of the temporal muscles covering the entire cranium and erecting huge intermediate and occipital ridges to accommodate the ponderous attachments their power requires, they are reduced in man to a limited and comparatively insignificant area upon the antero-lateral surfaces of the brain-case. The huge and massive bones of the gorilla's maxillary system have been lessened to the same wonderful extent. But the dental supporting mechanism that has been so much reduced in man is still of effective service in the mastication of the too few resisting articles of his food. The erection of this apparatus entails upon his economy, upon its developmental and nutrient powers, an extravagant expenditure of vital force, which, in the present state of man, is not warranted by its use in mastication. In lower animals the expenditure is normal and is stimulated and recompensed, as in other parts of the system, by normal use, which in man does not obtain. The present bony and dental structures of the masticatory apparatus in man, although in the main rudimentary as compared with normal development in the nearest allied inferior forms, imposes an immense tax upon the developmental powers of the economy. Witness the disturbance during infancy, childhood, and adolescence with which its evolution is attended, as if it were a pathological and not a physiological proceeding. The masticating muscles require expenditure beyond their value for their support, and the stimulus to growth and maintenance seems an inherited one, and not active. The region requires an unusual supply of blood throughout life, from the ovum to the bier, and exceeds any other special parts in vascularity. It is one of the earliest regions marked in the fœtus, and seems a very leech in its drain upon the circulation from the very dawn of life. It monopolizes largely a great and important branch of nerves, through this agent drawing upon and influencing the entire nervous organization. It is easy to observe that all this expenditure of force, during development and life-maintenance, is an exorbitant demand upon the economy, and, inasmuch as the function of mastication is passing into disuse, may be denominated as waste. In lower forms, where active employment stimulates maintenance and the equilibrium of demand and supply is sustained, we can conceive how the apparatus can be maintained, even so prodigious an one as the gorilla presents. But we also observe that in such lower forms as have lost use for certain parts of the apparatus, those parts have been suppressed (*i.e.*, to rudiments, or aborted, as certain teeth, bones or muscles) by nature for economic reasons. In man, we have reason to believe that the masticating structures, the dental armature and supports, are rapidly becoming useless; and their maintenance being an unwarranted extravagance, the signal has been given and their support is being withdrawn. It is difficult

to suppose that a region requiring so early and assiduous attention from the formative powers, or so much nutrition throughout life, could be permitted to continue the waste of force without making a return of service. Such a phenomenon would be contrary to all analogy! This expenditure being in excess of the requirements of any other region of the organism, the exalted organization of the parts is manifested in their peculiar susceptibility to disease and pain, many systemic lesions being indicated first in this region, and its own local lesions inducing systemic disturbance.

Another evidence of the occluding force in man (and one which the dentist and oral surgeon utilize in the important and beneficial operation of the correction of irregularity of the teeth) is the rapidity with which occlusion will cause movement and alteration in position in the alveolus of the teeth. This is observable in almost every denture, in its special manifestations, in causing the natural symmetry of position of the teeth while erupting, and in the too frequent negative evidence of irregularity and malposition owing to premature or retarded eruption. This is accomplished by the occlusion of inclining surfaces, which is so powerful for movement.

Another indication of the force is the development of the bones and muscles that support the teeth. The growth of the maxillaries exhibits dependence on the occlusion of the teeth for perfect and symmetrical production. Being at birth but mere shells containing the active, laboring tooth-forming pulps and growing crowns, as the teeth erupt and mastication comes upon them the bone solidifies and braces up the forming and formed roots to support the force. When the second denture comes into place the arch enlarges posteriorly, strengthens its substance, develops static force, and its arches and pillars of resistance but become more firm and dense with use. Negative evidence is again furnished by mal- and asymmetrical development, due to irregular eruption of the teeth, and the growth of bone prevented by the loss of the stimulus of occlusion. This force exercises a potent and wonderful influence in the acceleration of the growth of the bones and muscles, and the symmetrical moulding of the face in normal development.

The muscular system is dependent upon the irritation of use for perfect development, and the rising teeth require employment to effect successful eruption. This need is so strongly felt that the desire to masticate in a child amounts to a passion, a ravenous desire, in reply to an imperative demand from nature. Not only is this true previous to eruption of the teeth, when it is mainly membranous, but subsequently the desire is so strong that its indulgence produces a decided pleasure to the parts. Occlusion seems a necessity to perfect development, for growth depends largely upon the irritation of use, and the

desire for it seems to indicate a growing insufficiency of employment in the species.

With the presence of the teeth and their active use, the integrity of the jaws and muscles may be said to be maintained. As these are gradually lost as life passes on, the alveolus rapidly and the maxillaries and muscles slowly atrophy and become reduced. Slight irregularity, visible asymmetry, results, and the final total loss of the denture produces the well-known shrunken face of edentulous persons, especially when aged. This sunken appearance of the masticatory region is not due alone to the loss of the teeth. Suspension of the irritation of use to the parts brings a marked atrophy of bones and muscles, from withdrawal of the nutritive supply and consequent reduction. Asymmetry is frequently observable in persons who acquire the habit of asymmetrical mastication when the teeth are yet present, owing to disease of the latter, or some other lesion, upon one side. The substitution of artificial dentures will not restore atrophied muscles and plumpness of visage, for the reason that the required force cannot be sustained, and is not attempted. Valuable lessons might be drawn from this fact in artistic prosthesis. In age, disease usually renders the teeth, when remaining, unable to bear forcible occlusion, and in this way disuse accelerates the ordinary atrophy of senility.

CORRECTIVE TREATMENT OF CARIOUS TEETH PREPARATORY TO PERMANENT FILLING.

BY JACOB L. WILLIAMS, M.D., BOSTON.

(Read at a meeting of the American Academy of Dental Science, in Boston.)

THE subject for discussion this evening was before the academy several years ago, when some of my ideas in connection with it were mentioned, but at the request of the Executive Committee I have written a few thoughts from my observation and practice in this relation.

I shall not speak of the condition of actual opening into the pulp, but mainly of endangered pulp.

In the office where I was pupil, some thirty years or more ago, it was a common practice, when a tooth was too frail or sensitive to bear filling with gold, to close up the cavity with a stopping composed of gutta-percha and oxide of tin, simply to prevent sensation and lodgment of food.

Noticing that after this stopping had remained for some months the substance of the tooth became harder and less sensitive, also that in some cases new dentine had been formed, it occurred to me that a system of treatment for these objects might be of value in many cases, which proved to be the fact after a series of experiments; in the mean

time substituting oxide of zinc for the oxide of tin, as being less objectionable in regard to color; the main idea being to keep the cavities under positively corrective influences in all cases, and without inflammatory irritation.

With this object, after making sure that there was no active inflammation of the pulp, my first step was to carefully remove only the softest portion from the cavity, and then to insure the correction of any acid or fermentative elements, without irritating the pulp, which I found to be accomplished very satisfactorily by saturating with aqua calcis, or a weak solution of chloride calcis slightly scented with creasote; then, if tolerated without pain, with a mild astringent application of tannin; the cavity when dried being sealed up with the gutta-percha stopping, which was allowed to remain from one to three months for the more delicate cases, and longer for the stronger ones; then unstopping and renewing the applications and sealing up again, so continuing from time to time till the desirable degree of health and firmness was attained.

When fully assured of the utility of this treatment, I made a general statement of its mode and object in the *American Journal of Dental Science*, hoping that when cases so treated should come under the observation of other practitioners there would be less surprise that teeth should have anything but gold in them. But we may congratulate ourselves that within the past few years the value and often the necessity of preparatory treatment has become more generally known and appreciated.

The above is, in the main, the substance of my earlier practice in this regard, but I have found various applications and expedients useful in carrying out the general idea and in accomplishing the object desired, such as, in extremely soft and irritable cases, the application of sulphate of lime stopping for one or two days, rendering it possible then to apply something of longer though temporary durability.

The introduction of the so-called osteoplastic materials also added greatly to the means for treatment of many cases, and in such as those just alluded to I have seen excellent results from following the antacid and corrective saturation by putting into the dried cavity a thick layer of dry oxide of zinc, with perhaps a bit of carbolized paper over it, and then filling up the cavity with thick oxychloride for not longer than six or eight weeks before renewing or replacing with another temporary stopping of more reliability.

Again, where discoloration in the front teeth might be apprehended, oxide of zinc may be substituted for the tannin before mentioned. In speaking of tannin, it may be added that if pain should result from its too great astringency, relief may be given at once by the application of aqua calcis.

I have found also that there are certain conditions which require special delicacy and vigilance; one in particular, which I have referred to in a former paper,* is the tone or condition of the nervous system, whether it be from natural temperament or of transient diathesis. And I think that, as a rule, whenever the teeth are most disposed to decay, then is the greatest care and watchfulness needed in the treatment under consideration. And I have no doubt that occasional disappointments in what were deemed successful cases, but in which there has been subsequent loss of the pulp, may be fairly attributed to constitutional changes in that respect, even only for a few months.

In regard to sensitive dentine simply, it is well understood how much suffering both of patient and operator may often be avoided by preliminary treatment, for a time, either with oxychloride or gutta-percha stopping previous to permanent filling.

DENTAL EDUCATION.—A REPLY TO ROBERT ARTHUR, M.D.

BY GEORGE T. BARKER, D.D.S.,

PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN THE PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

IN the February number of the DENTAL COSMOS for 1876 is an article by Robert Arthur, M.D., with the above heading, which, in consequence of its manifest unfairness and injustice to existing dental colleges, deserves more than ordinary notice. In the outset he thus says:

"It has always been inexplicable to me how any person who has given serious attention to the subject of dental surgery should question its claims to the position of a specialty of medicine. By being based upon medicine, or making one of its specialties, is meant, merely, that the province of dentistry is the management of certain abnormal conditions of important parts of the human body, not clearly to be comprehended unless studied by the light of the general principles of medicine. What this term means was briefly explained in the last paper. It is obvious, then, if the general principles of medicine constitute an essential feature of a dental education, that they must form a part of the curriculum of a dental college, or the instruction afforded by it must be so far deficient. We come, then, to the inquiry as to the amount and character of instruction of this kind furnished by existing dental colleges. In making this inquiry my information will be drawn from the statements with regard to the course and facilities of instruction of these schools made in their annual announcements."

There are probably few persons who will consider it worth while to dispute with Dr. Arthur as to the position of dentistry as a specialty of medicine, but his aim and object in this and former communications is to show the unworthiness of dental colleges; and I beg to say some-

* See DENTAL COSMOS of December, 1872.

thing of my own knowledge on this subject. In the month of January, 1857, I came from a neighboring State to the city of Philadelphia, and having determined to study and practice dentistry, I called upon three gentlemen—Profs. Joseph Pancoast, Robley Dunglison, and Robert Arthur—to get their views as to the practicability of obtaining my instruction from a medical or a dental college. The first two named were professors in the Jefferson Medical College; their advice to me was to attend the dental school. I then called upon the then Dean of the Pennsylvania College of Dental Surgery, Robert Arthur, M.D., and the arguments by him presented to encourage a young man, who proposed to practice dentistry, to study in a dental college were so good, that I entered the institution at once, and have used them the *thirteen* years I have filled the chair at that time occupied by himself. No word was then said about the defects and want of instruction in dental colleges, nor of the inability of the then Professor of “Principles of Dental Surgery and Therapeutics” to do justice to students because the session was too short.

In the communication, Dr. Arthur states that his information as to the teaching of the three colleges which he selects as types of the whole is obtained from the annual announcements. I would ask, is this fair and honorable? What is an announcement? It is simply a concise advertisement, and is intended to give a few general facts, with the understanding, both implied and expressed, that the interested inquirer will communicate with the Dean of the college, by whom extended information will be furnished. If Dr. Arthur really desired to know the course of instruction of the chair of Dental Pathology and Therapeutics in the Pennsylvania College of Dental Surgery, why did he not write to me for such information, or make personal examination of the course of teaching, and thereby be enabled to speak with at least some knowledge of the subject he is considering? Instead of so doing he bases his information on the announcement alone, and says,—

“Let us now turn to the Pennsylvania College, and ascertain what provisions with regard to the present subject of inquiry are made in that school. I would avoid reference to particular institutions if I could in any other way accomplish my purpose. But, as I propose to show what dental education in the United States is, and how far it meets the just demands of the dental profession, I must refer to particular organizations, and examine their provisions for instruction, in order to ascertain what is taught; and, as the curriculum is, with slight variations, somewhat the same in all the schools, the three I have selected fairly represent the whole number.

“The whole of the subject of the general principles of medicine are in this school devolved upon the chair of ‘Dental Pathology and Therapeutics.’ Although the title of this department is very circumscribed, the incumbent gives it a wide range. He states that—

“‘The lectures from this chair will embrace general pathology, dental

pathology, the pathological relations of the teeth to other parts of the system, together with a minute description of all special diseases that have any relation to dental surgery or are of interest to the dentist.”

He then proceeds to give his ideas as to the programme embraced, and continues as follows:

“No intimation is given of any reference to special pathology, except as relating to the teeth. But this is a subject of broad general character. A mere glance at some of the particulars which it embraces, which would require careful exposition, and which cannot be said to be unimportant to a dentist, will show their great extent.

“Diseased irritability; diseased tonicities; diseased sensibility; diseased voluntary motion; diseases of the reflex and sympathetic nervous influence; diseases of secretion; anæmia, hyperæmia, plethora, local hyperæmia; inflammation, with its great variety of phases; diseases of nutrition; hypertrophy; atrophy; induration and softening; morbid growths, non-malignant and malignant. This, I have said, is the merest glance at the subject of special pathology. It cannot be for an instant contended that any clear ideas of general and special pathology could be given in less than sixty lectures, which would comprise about all that are delivered by each professor during the winter course of a dental college.”

It is just here that I take exception to Dr. Arthur's views, and say unhesitatingly that it is absurd to say that *no* clear ideas of general or special pathology can be obtained except the student hear sixty lectures. I have, and think he has, obtained clear ideas from a single lecture from one individual, while failing to get clear ideas from numberless lectures from another one. The position assumed is therefore untenable, because the assertion is too broad. But let us see what subjects are lectured upon in the college to which he refers. The first half of the session is devoted to the subject of materia medica and therapeutics, giving special reference to those agents that are used in dental practice; at the same time general systemic remedies receive appropriate consideration. About thirty lectures are thus taken up. The remainder of the session the following subjects are treated of,—sometimes devoting two, and to inflammation three or four, lectures of an hour each: nutrition, hypertrophy, atrophy, congestion, and determination; inflammation, “with all its varieties of phases”; contusions and wounds; injuries to the circulatory system; diseases of gums and salivary glands; diseases of maxillary sinus; fractures, general and special; dislocations, general and special; diseases of the bones; necrosis and caries; neuralgia; hemorrhagic diathesis; hysteria; syncope; dyspepsia; scrofula; pytalism; dentition and its derangements; syphilis; gout and rheumatism; diseases and defects of palate and larynx; anæmia; malignant and non-malignant growths; alveolar abscess, periodontitis, and rickets. These subjects are considered in thirty lectures, and though no one would deny that more instruction could be obtained if the session was

lengthened, or one professor had the whole course to lecture upon pathology, yet it can with truth be asserted that, even with the present teaching, the industrious student can with the aid of his text-books grasp broad basal facts in general pathology, and can appropriate readily the principles which underlie special pathology, to such an extent at least as will enable his teachers to say that he possesses sufficient knowledge to "*commence*" the practice of dentistry. It is not to be presumed that the dental student is fitted for the performance of the delicate or intricate operations of general surgery, but it is contended that he is as familiar with the diagnostic signs and symptoms of disease and pathological relations as students generally are whose knowledge is the result of study from books and lectures, and not the fruit of experience.

The doctor continues as follows:

"And yet, if this were not sufficient fully to occupy his time, he proposes to give 'particular instruction . . . in the best methods of taking impressions of palatine defects, and the making of artificial substitutes for their correction.'

"What the motive may have been for laying out such an extensive programme, a practice not confined to this school, as I have shown, for the incumbent of this particular chair, may have been, I can only venture to suppose to be something like that of an intelligent and honest principal and proprietor of a young ladies' school with whom I had a conversation a long time ago. I asked him why he offered to teach such a large number of branches of knowledge, including, among many others, physics, chemistry, astronomy, ethics, moral and mental philosophy, the higher branches of mathematics, political economy, etc. etc. He replied to the question, that, although he knew very well that neither he nor his assistants could teach these subjects, except in the most superficial manner, and, if they were fully capable, and could do so in the time at their disposal, the girls under his care could not comprehend them, yet it was necessary to make this great display in order to meet competition and to maintain the existence of his school."

The above criticism is most unfair, because, as my classes well know, the very knowledge referred to has been taught by me, and that too without any infringement of regular lecture hours. Therefore his reference to the proprietor of the ladies' school, while conspicuous for its *wit*, lacks appropriateness of application.

He closes his article in these words:

"I trust that what I am saying will not be considered as transcending the limits of fair and just criticism. It must be admitted that public and professional interests are paramount to the interests, and cannot regard the sensibilities, of those who profess to serve them, for their own private ends. They put themselves in the position of public servants, and must look for close scrutiny of their conduct as it relates to such a position. So far as they devote themselves faithfully and efficiently to the accomplishment of the important interests they have undertaken to subserve, they merit commendation and support. But if from any

cause they fail to do this, injured interests will show themselves to be no respecters of institutions or persons, and will not fail to make earnest and persistent efforts to effect such changes as will remove just causes of complaint."

I would respectfully contend that he has transcended the limits of fair and just criticism, because he has assumed certain conditions to exist, and has failed to obtain any accurate knowledge of the facts, except that gained from the perusal of the annual announcement. He has also failed to show that any advantage in instruction can be gained by the student who proposes to practice dentistry, by attendance in a medical rather than a dental school. In a future article I propose to review the teachings of both, and contrast their relative thoroughness and effectiveness.

If in this article no reference has been made to the other two institutions named by Dr. Arthur, it is because I am not familiar with their course of instruction; but their graduates have been met by me, and they were found to be men of culture and refinement, possessing general and special knowledge of their art, holding positions of honor at home and abroad, and these institutions may justly point to their graduates, as does the Pennsylvania College of Dental Surgery, saying, "These are our jewels."

CLINICAL REPORTS.

PHILADELPHIA DENTAL COLLEGE.

SERVICE OF PROF. JAMES E. GARRETSON.

REPORTED BY L. ASHLEY FAUGHT.

Saturday, Jan. 8th, 1876.—A case of ankylosis of the lower jaw in a child of ten years was presented. The difficulty had its origin in a fall, producing fracture of the ramus. After indicating the course of treatment required, Professor Garretson showed a condition of necrosis of the femur in the same child, which had been caused by the same accident. Here nature was making great efforts to throw off portions of dead bone. "How can we tell," said the lecturer, "that there is necrosed bone in this thigh? You may accept it as a rule, having few exceptions, that wherever a meat-like piece of flesh is found protruding from a wound overlying bone,—proud flesh as it is called,—as seen in this case, there you will find necrosis. I find in this case that I can pass my probe along the fistulous track, and touch, as anticipated, dead bone. I could relieve this patient very easily and certainly by cutting down upon the sequestrum and removing it, but as the parent refuses to allow an operation, the boy must wait for nature to perform this office; and this will be effected, if the patient has en-

duration enough to wait out the battle, either by a process of liquefaction, or otherwise by the casting out in bulk of the dead piece or pieces."

Case II.—A case of extensive disease, involving the right superior maxilla and the bones of the nose of a Mr. F——, who was sent to the college by Dr. Edwin C. Baxter, of Albany, New York. Originally commencing in the nares of the affected side, and supposed to have been an infection received from an epizootic horse, the inflammation had first attacked and killed the inferior turbinated bone, and had next passed to the jaw, which it had involved fully in the destructive process. A peculiarity of the case, as remarked by Professor Garretson, lay in the almost entire absence of external expressions of disease. For while the patient had the characteristic odor of ozæna, yet none of the other common phenomena showed themselves, with a single exception of an almost inappreciable sinus leading from the edentulous alveolar line into the antrum. In passing a delicate silver probe through this sinus, evidence was afforded of a large destruction of bone, and indications obtained for the character of operation demanded.

The patient being placed in a state of profound anæsthesia by Professor Stellwagen,—this gentleman assisting in the operation,—the soft parts were thoroughly dissected from the face of the maxilla, and the antrum entered by removing a portion of its anterior wall—evidently new bone; the diseased mass being thus exposed, there were removed: first, a necrosed eye-tooth having a large fang bent upon itself at right angles,—this was a tooth which had never erupted, and had no doubt lain from the period of its formation encysted in the cavity; next, fragments of bone, the bulk of which exhibited the sequestra as being the entire maxilla, which evidently had become encysted in an imperfect formation of new bone,—osteophytes. The operation was concluded by dissecting the turbinated bone from the soft attachments which still existed, and its removal through the antrum.

Five days after the operation the patient was able to return to his home.

Monday, January 17th, 1876.—On this date Professor Garretson exhibited to the class a case of encephalomatous disease, involving the whole of the right side of the face, in a woman who had been sent to him for operation from Chicago, Illinois, by Drs. Freeman and Hannaford of that city. One side of the nose was involved in a mass of fungous hæmatodes, the eye bulged forward over the orbital ridge, the temporal fossa was filled up, and the palatine arch was thrust downward upon the tongue. It was pronounced to be a case in which the risk so far outweighed the promise as not to justify operative interference; the patient was dismissed back to the care of Drs. F. and H., with palliative prescriptions and suggestions. Professor Garretson delivered a lecture, in connection with the case, on the treatment of carcinoma.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR MEETING, EXTRA SESSION.

(Continued from page 147.)

TUESDAY MORNING, Dec. 21st, 1875.

THE secretary then read the following paper, entitled "The Antiseptic Treatment of the Dental Pulp and Pulp-Cavity," by C. Spence Bate, F.R.S., Plymouth, England:

In the entire field of dental surgery there has been nothing that has more tried the energies of the scientific dentist than the desire to preclude the local irritation that arises from an injury done to the dental pulp. It matters little what may have been the primary cause; whether the lesion be natural or artificial; whether the irritating cause be mechanical or chemical. Any injury to the dental pulp invariably terminates in its more or less complete destruction, followed by a general disturbance of those tissues with which it is more closely connected. Periodontitis terminating in exostosis is, perhaps, the most simple. Periodontitis resolving in permanent gum-boil, or small suppurating abscesses, is the most frequent. Periodontitis leading to a large facial or glandular abscess is the most serious in the lower jaw, while in the upper the same may be complicated with the buccal antrum.

That an injury to the dental pulp should lead to extensive mischief we should be scarcely prepared to expect, if we were to judge by our experience of other dental tissues. It therefore becomes us carefully to analyze the immediate and more or less approximate causes that lead to a local and frequent systemic disturbance of so important and serious a character. We frequently see in the lesions of the teeth that an irritated pulp will give a very large amount of pain without any local disturbance of neighboring tissues; but soon afterward, when the extreme pain has passed away, the surrounding and approximating tissues exhibit general redness; and tenderness of the whole tooth becomes extreme, and is reduced only when a small suppurating gum-boil discharges itself. This is one of the most frequent forms, and so constant that many patients, and practitioners also, hail the eruption as a termination of a legitimate kind.

A stronger evidence of this can scarcely be brought forward than the just *éclat* with which Dr. Hullihen's operation of cutting a channel for the escape of secretions direct from the pulp-cavity was received,—thus preventing the storing up of the irritating waste material which ultimately would find a way of escape through the gum by a sinus of its own burrowing.

The Hullihen operation, by relieving the tooth, did good service, but can be viewed only in the light of an expedient; just as a seton will keep down inflammatory action in any other part. It cannot be accepted as a curative process, short of which it is the duty of the scientific dentist not to be satisfied. If an examination be made of all cases where and when a gum-boil of more or less importance is in active existence, it will be found an invariable rule that the pulp within the root or roots of a tooth that is connected with such alveolar abscess or gum-boil is dead.

In those teeth where there are more than a single fang, vitality may still exist in those that have no connection with the alveolar abscess; and a tooth so constructed may have internal inflammatory action complicated with alveolar abscess. But of this we may be quite certain, that each separate form of disease is connected with a separate and distinct root of the tooth in question. But it is also in the experience of all practitioners that a large number of roots or stumps of teeth do frequently exist in the mouths of our patients in what may be called a normal or healthy condition; that is, they are supported by a healthy and strong alveolar ridge. No gum-boil or chronic disturbance of any kind is apparent, and active disease is unknown. It appears, therefore, a point to be considered, so that we may obtain a knowledge of the immediate cause that may lead to the fact, that while in one instance the destruction of a pulp or part of the dental pulp may induce great local and general disturbance of a more or less serious nature, we find what may be considered to be a healthy and normal condition of the gums existing with the presence of a greater or less number of the remains of teeth that have been diseased.

We know by experience that very minute causes will set up very extensive and painful conditions. I remember well plugging a right lateral incisor for a gentleman on Saturday, and extracting it on the following Monday morning, with as severe an abscess as can be well supposed. The pulp of the tooth had long been dead, and the cavity open; the tooth was free from pain and easy to manipulate. A moderately-large gold plug was inserted, and the whole operation appeared to be one of the most favorable order. When the tooth was extracted, I found that a small bristle from the tooth-brush had been lost in the pulp-cavity, and had, by the pressure of the gold, been forced through the extremity of the fang, and set up the tremendous irritation that led to the loss of the tooth.

This may be classed among the unusual cases, but the following is one that is much more frequently met with, and, I believe, occurs more often than has been recognized or recorded. A gentleman was sent to me by one of our leading general practitioners to pronounce an opinion on a small but constant abscess on the chin, as to its connection with

the teeth or the bone of the lower maxillary. The teeth were free from caries of a usual or common form, but one of the lower incisors had been fractured through a jump in early life, so that the dentine was exposed and an opening made (probably from caries) into the pulp-cavity. This led to the destruction of the pulp itself, and its total disintegration and removal. Into this cavity the saliva flowed, and, passing down to the extremity of the root, formed a small nodule of calcareous deposit on the tip of the fang, which set up a severe and constantly-increasing anguish within the dental alveolus, that resulted in the sinus ulceration.

These may be more or less exceptional cases, but there must be a cause separate and apart from the loss of the pulp within the tooth that induces an active or chronic disturbance of tissues which are more or less distant from the tooth itself.

One such cause has very commonly been said to be the use of arsenic as an agent for the rapid destruction of a pulp, when local inflammation has been severe. That alveolar abscess frequently follows the use of arsenic is true; but it is equally true that it is neither the immediate nor the remote cause. To demonstrate this to my own satisfaction, I have kept arsenic in the tooth of my daughter, a pupil, and a servant for three or more months, and for one of my most grateful patients I inserted a permanent plug over an arsenic pledge, about twelve months since, without the least sign of local irritation or disturbance of any kind whatsoever. I therefore contend that periodontitis and alveolar abscess are never caused by the use of arsenic; and, when they have followed its application, they have been the result of the imperfect system of treatment which the tooth has received.

As shown in the two cases stated above, the immediate causes of periodontitis may be exceptional and numerous; but the more frequent and constant cause is the presence of a greater or less portion of a decomposed tissue, the remains of the dental pulp still retained within the pulp-cavity. We may frequently find a tooth or stump remain in the mouth, free from pain or local disturbance, in which the dental pulp has been destroyed but still retained within the pulp-cavity. An attempt to plug such a tooth without previous treatment results invariably in much local disturbance and pain, induced, I contend, by the shutting in of the unhealthy secretions, and the consequent irritation of the periodontal membrane. Our plan of treatment should therefore be, universally, the complete extirpation of the tissues within the pulp-cavity; at least, of every particle that has become decomposed either by natural causes or surgical manipulation.

So far, in theory, we state all that need be done; but the complete removal of the disintegrated tissues is not so easy in practice, and the boldest of our ablest practitioners are not able to pronounce positively

on the fact in the most simple of cases. In ordinary cases we can readily remove the pulp up to the extremity of the larger and straighter fangs. But in those where the pulp is flattened out to a thin membrane, frequently lying in a curved channel, nothing less than extensive drilling can overcome the difficulty. Our plan, therefore, it appears to me, should be, rather, that the remains of the dental pulp should be so treated that it may not have the power to excite further irritation of the lining tissues with which it is more or less in immediate connection.

The plan that I propose is the use of antiseptics for the purpose of precluding decomposition of that part of the dead pulp which is unavoidably left in the tooth. To show this, I think the following two or three cases, taken out of several hundred tabulated for my own satisfaction since the year 1870, will fully illustrate. It is now some time since I undertook to preserve a first upper molar on the left side for a lady who took great care of her teeth generally. She consulted, and had the tooth plugged by, her dentist, but afterwards experienced repeated attacks of pain, terminating in a small gum-boil. After repeatedly calling on him for relief, she was informed that nothing but extraction was left for the case. In reply to her inquiry, I undertook to save the tooth, which, I am happy to say, after several weeks of painless treatment, I succeeded in doing, and permanently filled the tooth and preserved it until her death, which took place several years after the operation. My first care was to remove the existing plug and cut down to the pulp-cavity, which, as there was a gum-boil in connection, was in all probability likely to be opened into without much pain. The pulp I found in a state of partial decomposition. I removed it to the fullest extent possible, and inserted into the cavity a pledget of cotton saturated with tannic acid dissolved in glycerin. At first I repeated the dressing every two days, then weekly, then at longer intervals. By too long a delay I found the tenderness of the tooth to return. After about three months of this treatment,—a period that was prolonged by several weeks owing to the birth of a child,—I succeeded in arriving at a satisfactory termination, and inserted a permanent gold plug. The patient resided not very far from me, and I was therefore enabled to watch the history of the case to the termination of the lady's life.

The above case occurred several years since; it is recorded from memory, and only the general outlines are given. But those cases which follow have been of more recent date, and the more exact details can be reported with certainty. On the 7th of April, 1875, Mrs. M. consulted me with a case very similar to the preceding. She had had a tooth stopped and restopped, and still was suffering. When I saw her, her face was much swollen and the tooth tender to the touch, but there was no gum-boil. My first care was to remove the existing plug

and cut into the pulp-cavity. Not being certain of the entire destruction of the pulp, I dressed the central cavity of the tooth with glycerin and carbolic acid. April 12th, swelling abated and tenderness gone. Dressed the tooth with glycerin. April 14th, dressed the tooth with glycerin. April 20th, perceiving a return of tenderness, I wiped the cavity of the tooth with Condyl's ozonized fluid, and dressed with glycerin and carbolic acid, retaining the dressing with a copal and cotton plug. 29th, dressed the tooth with glycerin, retaining the material with a gutta-percha plug. This was retained for about a month; then the tooth was re-dressed with glycerin, without cotton, and plugged with Hill's gutta-percha stopping. The patient then left for a round of visits, and called a week ago to report all well, which state at this date (Nov. 12th) continues, with the intention of a permanent plug being inserted at our earliest convenience.

The following is a similar case, except that I commenced its care from the beginning. On the 29th December, 1874, I destroyed the pulp of two teeth with carbolic acid and arsenic; one of the teeth, a second upper molar on the right side, was also suffering from acute periodontitis. January 2d, 1875, I plugged one tooth permanently, after removing the previous dressing and decomposed pulp. The second, after extracting the dead pulp (the tenderness being gone), I dressed with glycerin and stopped with a temporary plug. January 8th, I stopped the tooth with gutta-percha. February 3d, tenderness of the tooth returned; removed the gutta-percha plug and dressed with glycerin. February 5th, tooth tender to the touch, the gum very red; dressed internally with glycerin; painted the gum with a mixture of iodine and aconite. February 9th, tooth still tender; re-dressed it internally with glycerin and painted the gum with aconite and iodine. March 5th, tenderness gone; dressed with glycerin. March 18th, plugged with Hill's stopping previous to permanent plug. To the present date the tooth has continued well.

These were cases of interest that required care, and received it, both by the attention of the patient and the desire of the operator. But there are a large number of patients who, instead of co-operating with and assisting the dentist, act rather as obstructors, and are far more anxious to be free from pain, however little, than put up with a temporary inconvenience to save what might become a valuable tooth. It is in such cases that successful treatment is speedily desirable, and such, I believe, the antiseptic treatment will be found, as the following case will show.

A gentleman called on me about six months since, with some pain in the left upper canine. I cut into the pulp-cavity, and applied to the pulp a mass of carbolic acid and arsenic. His immediate relief was not much, and he returned in about two hours with the determination

to have the tooth out; but, fortunately, I was from home. The next morning he called, being free from pain. I removed carefully a portion of the pulp, injected into the cavity a considerable quantity of glycerin, and stopped the tooth with Hill's stopping. Three months after, the man called on me to have a gold plug inserted. He had had no pain from the day I last saw him. Being engaged, I put him off until his next journey should bring him to Plymouth. Had the tooth not been a valuable canine, I should have put in a permanent stopping at once, and in the majority of cases I do so, finding so small a percentage of failures that I attribute them to other causes than fault in the theory; such, for instance, as an insufficient quantity of glycerin being forced into the pulp-cavity, or to the presence of an incipient disturbance of the periodontal membrane which I had failed to diagnose.

The question often has occurred to me, and probably to others, What can be the action of glycerin? I can only say that it is the most perfect antiseptic that I know of in relation to muscular or vital tissues. I have preserved delicate crustacea in it for a considerable length of time, without even change of density or of structure of the various tissues. I have observed that not only will it preserve healthy and living tissues, but it retains in the same condition, without change, the partially-decomposed tissues of pathological specimens. I therefore believe it is capable of preventing the decomposition of healthy pulps, and of retarding the further decomposition of those that may have already commenced disintegration. I know not its action; it must be something more than the mere exclusion of the air, as it soon becomes absorbed and disappears. I have observed that it speedily reduces topical inflammation. In a case that I had some time since, I found, after the removal of several teeth, a passage through the alveolus of one tooth into the antrum. My patient called a few days after with a swollen face and with pus flowing from the passage through the alveolus from the antrum in considerable quantity. I opened the cavity and wiped it out with carbolic acid diluted, but there appeared to be no beneficial results. The next day I inserted into the cavity a large quantity of glycerin. This caused a marked improvement, as the pus lessened immediately in thickness and in quantity. This treatment required only two or three applications. As the discharge lessened, the passage gradually closed and healed over. A day or two since one of my workmen severely scalded his hand and was in great pain; but the application of glycerin saturating cotton-wool speedily gave relief, and the hand healed without any further dressing.

My theory is to reduce inflammation in the dental pulp, and then remove as much as practicable, if in a decomposed condition, but preserve it if possible. In this I have found the application of glycerin very valuable, if the pulp be worth preserving, as it is mostly in

incisors and the first molar teeth, where the change of color that frequently follows the loss of the pulp becomes a disfigurement. The treatment that I have pursued with some success is to cut well down to the pulp-cavity and expose as large a portion of the pulp as possible. Touch it with highly-concentrated carbolic acid, place over it a pledget of cotton saturated with glycerin, and plug with gutta-percha. A few days after, if well, remove the temporary plug, re-dress with cotton and glycerin or the gutta-percha, and insert a permanent plug. I have found this successful in several cases; but where it is necessary to remove the pulp, it is desirable to work through glycerin, as its presence excludes the admission of air to the irritated tissues within the cavity. This precludes the commencement of disorganization of the tissues and the consequent formation of pus.

The basis of the theory of antiseptic treatment rests on the exclusion of air during operation within the pulp-cavity, the preservation of the dental pulp when it is healthy, and the prevention of its decomposition where diseased. My experience, after six years of systematic treatment, tells me that the introduction of a liberal supply of glycerin into the pulp-cavity during the operation produces results more favorable to the preservation of a tooth than any other treatment within my knowledge.

It must not be expected that this, more than any other treatment, is intended as a royal remedy. Careful manipulation is the one thing most needed, and the injection of glycerin into many of the smaller cavities of the roots of the teeth will not be found easy; and without this, success is by no means probable; with it, the percentage of successful cases in which periodontal irritation is prevented will be found to largely exceed those of failure.

Discussion.

Dr. George S. Allan. There are a few ideas in that paper which strike me as singular: especially regarding the use of arsenic,—that it can be left in the teeth almost any length of time without any serious injury. As I understand it, arsenic acts as a catalytic on the tissues. It does not decompose the tissues, except by its mere presence. When we use arsenic in undue quantities we shall have irritation; whereas, if we use a little, simply enough to destroy the pulp, we in a measure get rid of the irritation and consequent pain.

If I destroy a pulp by placing arsenic on the exposed point, the pulp is destroyed to the point of the root. Now, in some way the arsenic has impressed its power not only on the part of the pulp exposed, but also to the foramen. Now, by what logic or reasoning Mr. Bate can say, as he does indirectly, that the action of the arsenic ceases at the foramen, I don't know.

My experience is that arsenic used in undue quantities, or left in a tooth for too long a time, will ultimately produce inflammation and death beyond that portion of the soft tissue to which we wish its action to be confined. Some years ago, when making some sections of teeth, I had one put into my hands that had been destroyed by arsenic. There were some peculiarities in the walls of the dental pulp which impressed themselves on my mind. Ordinarily, in making a section of a dead tooth, the decay found on the walls of the pulp-chamber and the canal is precisely the same as that seen in ordinary caries. It is soft, and breaks up under the excavator in the same manner. Now, in the section of this tooth, which had been destroyed by arsenic (the arsenic having been in it for some time), the disintegration was entirely different, and the structure broken up into globules. The *pulp-character* of the decay was gone, the hard lining processes of the cavity were red and granular, the reddish appearance had passed far beyond in the softening of the dentine, and I cannot but believe that the action of the arsenic had gone through the dentinal tubules to the periphery of the tooth. Mr. Spence Bate does not overvalue filling of the roots.

But I noticed one term he used which, I think, was seriously objected to at one of our American meetings,—that is, the word “fangs.” I believe we call the portion of the tooth below the gums a *root*, not a *fang*.

Dr. Shepard. I do not rise to discuss the object part of the paper, but to say that perhaps it is not, in general, up to the average of American ideas. The statement in regard to the Hullihen process is, I think, not strictly correct. It is a number of years since I read the literature on that subject, but if I remember right, the crowning idea of Dr. Hullihen was that, by amputating the live pulp, he could thereby secure retention of life in the part of the pulp above the bone cut off. It was not simply to give vent to the accumulated decomposed matter. That is, I think, only an after-part of Hullihen's idea. That part of the process in which the credit lies to Hullihen was the recognition of a fact which antedates the capping of the exposed pulps, and that, by treatment and amputation, life could be retained in part of the pulp, while the remainder is dead.

Dr. Atkinson. The real intent of Hullihen was simply to deplete the congested pulp, and was based in a correct apprehension of surgical treatment. The result named by Prof. Shepard is the first one attained, and has been preferred to another result. Any other interpretation put upon this process is, as the professor says, an after-thought upon the main object. I wish to recur to the subject as spoken to by Dr. Allan. Dr. M. L. Wright, of Cleveland, used arsenic more demoniacally than any other man I ever knew except J. D. White, of Philadelphia; which seems to corroborate the statements in Mr. Bate's paper. When patients applied to him with aching pulps, he would liter-

ally fill the cavity with white oxyd of arsenic, cover it up with wax or anything, and tell them to go their way; that when the right time came the pulp would fall out, and if they then wished the tooth filled, he would do it; but that the tooth would be well, in any case. I have seen numerous cases of this kind, but I have seen no arsenical influence, even from such excessive use, upon the general system, or any local action.

Now, as to what we mean by catalytic action, and all the terms we use signifying the morphological changes that occur in tissues of the human body. It is well for us to be aware of the significance that other people put upon these terms. I understand catalysis not to require *quantity* of presence to act. Catalysis means when a body *does* act by its presence, as nominated in the remarks of Dr. Allan, without loss of its own substance; but, then, in pursuit of the subject, the doctor said that "where the quantity is larger, the action (he did not say catalytic action) would be more," and "that it might go beyond the foramen to the mass around the foramen." I wish to correct that statement. It is by no means even exceptionally the result. The application of arsenious acid to the incision and immediate tooth-pulp is not always sufficient to destroy the foramen. I have often removed portions that have been so operated upon by the inflammatory process, that a line of demarcation was set up between the necrotic point and living pulp, and I have taken that part away. I have seen such cases very many times. I have repeatedly seen it occur where the obtunding of sensitiveness of dentine had been produced by applying arsenic. But all the mischief in such cases has occurred subsequently, when the patient has fallen into the hands of somebody else. In my experience I have several times removed fillings under such circumstances, and found a drop of pus at the cornua of the pulps. It had universally operated in that way. Taking out that pus, sometimes the pulps have been restored, and remained healthy as long as I followed the history of the cases. In other instances the pulp died, and then the question would recur, "Why did it die? What was the immediate antecedent condition of its death?" I don't think it was arsenic at all, because the pulps had been permitted to experience its activity, whether catalytic or escharotic, only through the endosmotic action taking place through the dentinal fibrils down to the pulp proper, and its energy had been limited by some sort of a combination which I cannot explain.

It is my understanding of dynamics, that there is a measure of power affecting pulps which can be satisfied and which can be expended entirely or partly. It is as literally a mechanical effect as anything can be. Let us not entrap ourselves with the idea that death of the pulp to the foramen always results on the application of this remedy, or that

there is always subsequent mischief occurring to the adjoining tissues. I doubt whether there is *ever* any such result as that, where the arsenic has not been carelessly applied and finds a lodgment upon the gums. I have plenty of cases of necroses taken out from the margins of the plates of the alveoli, where the careless use of arsenic had produced destruction; but where the operation is made as delicately as the delineations of this paper would indicate, I would never look for such cases.

Dr. Bogue, of New York. I wish to say a word in connection with this paper. Mr. Bate is well known as one of the working men of our calling on the other side of the water. It seems to me very evident from his paper that he has taken up these investigations by himself, mostly for himself, doing the work alone which we, almost to the tune of hundreds, have been engaged in. So far from speaking disrespectfully of the work he has already done, I feel like rejoicing that he, alone, has made the progress towards a practical stand-point which, perhaps, we reached, as a good many working together, a little in advance of him. I say this in order that it may be understood that the gentleman who kindly favored us with this paper may be looked upon as one who has not had the advantages of professional association and interchange of thought which we have had.

Dr. Rich, of New York. I have nothing to say upon that paper. I would like to speak about the history of the Hullihen process. Dr. Hullihen brought out his process at a meeting of the American Society of Surgeons, at which I was present. Its object was to get rid of the pressure of inflammation and prevent alveolar abscess at the point of softening. That was the whole extent of his idea. It was received with great favor at that time, and praised by almost every dentist throughout the country for a long time. There is another point that Dr. Shepard made which I would like to correct also. This process was not anterior to the capping of the nerves, because that had been practiced by a large number of practitioners quite a long time previous to this statement of Hullihen as to how he had been able to relieve inflamed pulps.

Dr. Flagg. I used to be very particular in asserting that I was one of those who went to the extreme end of every canal. In every tooth I treated I wanted that laid down as a fundamental law. I went as far as any in that direction, but I have been for a long time very much exercised over that portion of the pulp which was left unavoidably in the distalic extremities of the fine canals. I have tried all sorts of things that have been suggested as antiseptic treatment. If glycerin is such an excellent material for the purpose, I shall try it on my return to my office.

About thirteen or fourteen years ago Dr. J. D. White laid down as a

proposition in regard to arsenious acid,—“first, that creasote was an essential oil (it is not); second, that creasote is the best solvent of arsenic.” That was the first thing occurring to create a difference on paper between us,—a personal difference on paper between Dr. White and myself. And some of you old men may recollect that, at the second regular meeting of the American Dental Association, I presented a paper on arsenious acid, which was the result of six years’ investigation. It was easy enough to say that creasote was not an essential oil, but it was not so easy to say that arsenic was not soluble. Practically, so far as power of analysis is concerned, it is insoluble. I took a grain of arsenic and left it for several hours in creasote, and then the bottle was shaken several times a day for six consecutive weeks. At the end of that time the bottle was placed carefully on a shelf in the closet. I then carefully drew off a portion of the supernatant fluid of that creasote, carried it to one or two chemists of the city of Philadelphia, and asked them to tell me if there was any arsenic in that creasote. They found none. I said, “Gentlemen, you are experts, and I am going to publish your statement in regard to this.” This was pinning them down too closely; they scratched their heads and looked doubtful. That would not do for me. I went from man to man, until I came to my friends Edward Parrish and Henry Morton, and those gentlemen told me I was at liberty to use their names in publishing the statement that creasote, instead of being an essential oil, a mighty solvent of arsenic, is no solvent at all.

Then came the action of arsenic on the pulp. I placed a small portion of arsenious acid—one-twenty-fifth of a grain—on a piece of cotton, mixed with acetate of morphia, the whole being in turn mixed with creasote, placed it in a pulp-cavity, and devitalized that pulp. I made that same application to a number of teeth, and I left the cotton in each for two weeks, and in some, I think, for three weeks. Each one of those pulps I extracted from those teeth painlessly. It was a perfect devitalization of the pulp. They were taken out and held up before my patients, and they were told, “That is the pulp of your tooth;” and when I held this up and told them, every one of the ten said, “Is it possible that you have taken that from my tooth without my knowledge?” If they did not know it, it couldn’t have hurt them much. These pulps were then placed on paper, the terminal ends where the arsenic came in contact with them were cut off, and the remainder of the ten pulps analyzed in a bunch. They were treated by Reinche’s test for arsenic, which detects a two-hundred-and-fifty-thousandth of a grain. In the whole ten there couldn’t have been the two-hundred-and-fifty-thousandth of a grain, because there was not the ghost of the shadow of a show of arsenic. Now, if there was not the ghost of the shadow of a show in ten pulps, how much was there in one?

Then the question came up as to the secret of the action of arsenic; whether it was able to do what has been ascribed to it. As Dr. Atkinson says, notwithstanding the acid was not there in the pulp to our apprehension, the dynamic effect of arsenic was felt upon it. Now, I say it is not possible for this small quantity of arsenic to destroy all that pulp, as arsenious acid would do if it had penetrated there. It would destroy its vitality; but, as an antiseptic, it saves it for ever and ever. After this, I sent men out into the ditches which surround my good city, and they got for me frogs of large size,—first-class frogs, from half a pound to three-quarters,—and I made applications on the webs of those frogs' feet of one-twenty-fifth of a grain of arsenic. Day by day those frogs sickened, and at length they died. I placed those treated as I have mentioned by others not so treated; I allowed them all to putresce together, and in the midst of those in which putrefaction took place, those treated with arsenic held their own nobly,—perfectly preserved.

The next inquiry was, how long this arsenious acid would remain in the teeth and not produce that periodontitis which is produced by arsenic passing through the foramen. Such irritation is always caused by bungling operation. It is not caused by arsenious acid. I systematically made applications which were to remain from two weeks to six months in teeth. I chose the lower teeth for the reason that arsenic is a heavy substance, and its operation, through the law of gravitation, would be more certain in the lower teeth. I allowed it, in one instance, to remain for one year and three days in a lower bicuspid having a single, straight root, so that if the arsenious acid would go there at all, it would go through that channel. But it *didn't go through*. Gentlemen, it does *not* do any harm. I wrote that paper eight or nine years ago, and here we come to the discussion of arsenious acid at this day!

Dr. Rogers, of London, England. Gentlemen, I am not aware that the treatment on our side of the water varies very materially from yours. We use arsenious acid to a great extent in small quantities,—about one-sixteenth of a grain, not allowing it to remain in more than twenty-four hours. I believe that Prof. Spence Bate has made applications leaving it in the tooth for a considerable length of time without any detriment to the tooth-structure.

Dr. Buckingham, of Philadelphia. The subject of treating the nerves is one of the most interesting and important that we have. The action of medicine on pulps should be studied more thoroughly than it has been; more especially the action of arsenic. That arsenic acts in other ways than by its mere presence I am satisfied. That arsenic is soluble to a certain extent in the fluids of the mouth, and in water, I am equally satisfied. I know it from actual experiment. We

know that when application is made of this substance to an external wound, it is liable to be absorbed and carried through, and show itself elsewhere, even in the stomach and liver. We know it enters into the circulation, and is carried throughout the system and produces poisonous effects. I do not think arsenic is soluble in creasote to any extent. Several years ago, in experiments in which trituated arsenic was put in creasote for a considerable length of time, and this creasote then tested, there was a trace of arsenic in the creasote, but I attribute it to suspension and not to solution. They are both acids. Acids do not combine without destroying the effects of each other, and that arsenic is suspended in creasote I am satisfied. The extremely small particles of the arsenic would be suspended in the creasote and would not be precipitated by merely standing; and tests would show the presence of arsenic afterwards. I say, then, that arsenic acts in other ways than as a catalytic. If arsenic acted only by its mere presence, it would not be found in the other parts of the system. I think we can all bear testimony to the fact that when arsenic is applied to the pulp of a tooth it eventually destroys that, and then goes through the pulp-cavity into the jaw, and produces irritation there. I don't say it would do so in all cases, but I have seen it do so frequently. It destroys the vital part, but it does not decompose the tissue. If you get a pulp into a high state of inflammation and then place arsenic in it and allow the arsenic to travel, it will go through to the end of the root, and produce inflammation on the inside. I don't think we should defend the application of arsenic in a tooth any longer than to produce the effect which has been desired, namely, to obtund sensibility so as to remove the pulp painlessly.

In regard to the treatment of teeth by this substance, I think we can hardly call it an antiseptic. Its proper action is, apparently, to destroy to a certain extent; not to preserve. How does carbolic acid save teeth? What effect has it? Here is the point. Carbolic acid combines with the tissues and suspends their vital action, but it does not destroy the structure. Take vegetable tissues. If you soak seeds in carbolic acid, you will stop the growth; but take those seeds out and wash them in water, removing the carbolic acid, and they will afterwards grow. The vital action is *suspended*, not destroyed. This is the manner in which, I believe, its great effect of preserving the tissue of the pulp is produced. When we apply it to an exposed pulp it first coagulates the albumen, and then prevents the free acid being absorbed to a greater extent. It produces a covering over the surface of the pulp. I do not think this tissue that has been so acted upon has been destroyed; I believe that if the acid could be washed out, the tissue would return to its original condition.

Carbolic acid destroys the vitality of those spores floating about in

the atmosphere. Reinche tells us that if you would prevent the exposure of wounds to the air, keep them from the air and treat them with carbolic acid. It destroys those spores. You prevent putrefaction and fermentation,—one of which takes place in the animal tissue and the other in the vegetable. Their products are similar, and when we prevent those spores from germinating, we prevent putrefaction. Carbolic acid does this. Applying this with hydrochloride of zinc, you have the spores entirely destroyed, and allow nature to go on and perform its functions.

I believe hydrochloride of zinc acts as a preservative to the nerve, for it does not destroy its vitality, only suspends it; and, when its action is suspended, the vital action is restored so gradually that the parts will tolerate it. When you put a filling over an exposed pulp, inflammation would naturally intervene at once. By the application of this remedy inflammation is suspended, and you may allow it to take place gradually until the normal action of the parts is entirely restored.

I believe it is impossible to tell exactly what quantity of arsenious acid is required to destroy a pulp. I know it is small. I believe this acid can be removed from time to time. I have taken the pulp removed from a tooth and applied to it Reinche's test, and I have found arsenious acid in that pulp. Now, this arsenious acid is soluble and may be washed out as in crystalline substances, perhaps by the circulating fluid, and the pulp may be thus deprived of the acid. I believe that one application of this acid to the pulp does not preserve it forever. Take the white of an egg, put some arsenic in it, agitate it, and you get from it tests of arsenic; pour some water over it and wash it, and you will wash every particle of arsenic out; you will not leave a trace, and the egg will decompose very speedily. Arsenic does, in a manner, preserve tissue; but it is washed out by the circulating fluids that pass through the tooth or in its neighborhood.

Dr. Palmer, of Syracuse. Dr. Flagg and Dr. Buckingham are both right. They have stated facts in regard to this question; but, unless we understand the working of electro-capillary forces, we can never know why arsenic is not taken into the pulp; we never shall know why it can be taken into the circulation and be found in the other parts of the system.

In a voltaic battery, having platinum-plate with zinc, the zinc will be entirely subjugated or used up if the battery be allowed to stand. Now, take the sulphate of zinc thus formed and have it analyzed, and you will not find any platinum in it. Now, put in another piece of zinc, and thus keep zinc with the platinum as long as you please, you will have unchanged the same platinum there. If we could have arsenic in the form of plate and use it as a capping, we would have in its action the process just illustrated in the zinc and platinum battery,—namely,

a changing of the polarity of the electro-capillary action, which sets back the current, and thus is death to the pulp or tissue. Again, why does arsenic go to different places? It will do this if it is put in a good conveyance by which it can be carried through before it stops the action of the capillary vessels. It may then be found elsewhere in the system, because the arsenic in its fine globules is susceptible of being conveyed. But when it destroys the capillary action, it has no means of conveyance any further, and it is confined to the surface, merely setting back the current, and you will not then find the arsenic in the pulp. If you take platinum, file it up, and cut it into those globules, there is a possibility that it might be carried through. If carried through in a compound shape, every molecule of the compound will be an element indestructible in itself; but it will set up this electro-capillary action, destroying that which it comes in contact with.

Dr. Flagg. There is a difference between Dr. Palmer and myself. I said definitely that there was no arsenic in those pulps. Dr. Buckingham said he took those pulps and found that there was arsenic in them. I found it was *on* them. There is a very great difference between *in* and *on*. I carefully cut off every portion of the pulp with which the arsenic had come in contact.

Dr. Buckingham. That arsenic is soluble, and that there are fluids circulating through the pulp which would be likely to carry this substance into the pulp itself, I think are sufficient reasons for what I have stated. It is a fact well known in physiology, as well as in surgery, that arsenic may be applied to the surface of the body, and the poison may be carried throughout the system. In this very test which Dr. Flagg described, I will state that I helped him with the analysis in my little laboratory. We applied the arsenic to the web of a frog's foot, and we found a test of arsenic in the other leg. We found it in almost every part of the animal. The arsenic had penetrated the whole surface, not only the feet, but all the tissues; in fact, had gone entirely through it. I think arsenic may be carried in the pulp in the manner I have described. I admit that I am liable to error, but I am perfectly satisfied in my own mind in regard to this matter.

Mr. Dexter read a paper, entitled "Necrosis and Caries—Formation of Pus—Inflammation Defined,"* by William H. Atkinson, M.D., D.D.S.

Adjourned.

(To be continued.)

* This paper was published in the DENTAL COSMOS, February, 1876.

DENTAL ALUMNI ASSOCIATION OF THE MARYLAND DENTAL COLLEGE.

At the annual meeting of the Alumni of the Maryland Dental College, held at the college on Friday evening, March 3d, 1876, the following officers were elected :

President.—Dr. Fred. A. Levy, New York City.

Vice-President.—Dr. John J. Williams, Baltimore.

Secretary.—Dr. Chas. E. Busey, Baltimore.

Recording Secretary.—Dr. Richard M. Johnson, North Carolina.

Treasurer.—Dr. Cyrus M. Gingrich, Maryland.

BALTIMORE COLLEGE OF DENTAL SURGERY.

The thirty-sixth annual commencement of the Baltimore College of Dental Surgery was held in the Academy of Music, Baltimore, on Friday evening, March 10th, 1876.

An address was delivered by James Allen Glenn, of the graduating class; the valedictory by Professor E. Lloyd Howard, M.D.

The number of matriculates for the session was fifty-two.

The degree of D.D.S. was conferred on the following members of the graduating class by Professor F. J. S. Gorgas, M.D., D.D.S. :

NAME.	RESIDENCE.	THESIS.
Rufus Calvin Bowman.....	Virginia.....	Treatment Preparatory to Filling Teeth.
George Crowther.....	South America.....	Mechanical Dentistry.
Herbert E. Dennett.....	Massachusetts.....	Lining the Walls.
John P. Dennett.....	Massachusetts	Mechanical Dentistry.
Edward P. Doremus.....	Louisiana.....	Dental Caries and its Causes.
William Henry Dwinelle.....	New York.....	Gold—Its Relation to Dentistry.
Richard Atwell Fox	Virginia.....	Development and Structure of the Teeth.
James Allen Glenn.....	North Carolina.....	Circulation of the Blood.
Elise von Heyden.....	Prussia.....	Secondary Dentine.
Samuel Kimmell.....	Maryland.....	Nitrous Oxide Gas.
William Samuel Krebs.....	Maryland.....	Anæsthetics and their Application to Dentistry.
Ezekiel Daniel Margary.....	West Indies.....	The Extraction of Teeth.
Brainerd T. Olcott.....	New Hampshire.....	The Effect of the Diet upon the Teeth.
William La Fayette Seigler.....	Florida.....	The Teeth.
Wharton Hume Shine.....	Florida.....	Digestion.
Augustus Wilson Sweeny, Jr.....	Maryland.....	The Relation of Dentistry to Medicine.
William Oscar Thrailkill.....	Kentucky.....	Injuries to the Teeth and Soft Structures by Mechanical Violence.
Otho Frank Welsh.....	Virginia.....	Mechanical Dentistry.
Gurdon F. S. Wright.....	South Carolina.....	The Bicuspid.

OHIO COLLEGE OF DENTAL SURGERY.

THE thirtieth annual commencement of the Ohio College of Dental Surgery was held in the lecture hall of the college, Cincinnati, March 2d, 1876.

The annual address was delivered by Dr. W. H. Goddard, of Louisville, Kentucky.

The address to the graduates by Prof. James Taylor, President of the Board of Trustees.

The valedictory on behalf of the class by Dr. T. C. Kern, of Nebraska.

The number of matriculates for the session was twenty-seven.

The degree of D.D.S. was conferred upon the following graduates by Professor Taylor:

NAME.	RESIDENCE.	THESIS.
J. R. Bell.....	Ohio.....	Treatment of Exposed Pulp.
E. G. Betty.....	".....	Opium.
A. T. Good.....	".....	Dentistry and its Relation to other Sciences.
N. S. Hoff.....	".....	Development and Eruption of Deciduous Teeth.
W. R. Hale.....	".....	Causes of Decay.
C. I. Keeley.....	".....	Filling Teeth.
W. D. Kempton, M.D..	".....	Inflammation.
E. W. Poole.....	".....	Fifth Nerve.
C. F. Porter.....	".....	Digestion.
A. Taft.....	".....	Continuous Gum Dentures.
J. B. Kidd.....	Kentucky.....	Effects of First Dentition.
C. E. Canine, M.D.....	".....	Nitrous Oxide.
E. H. Lathrop.....	California.....	Anæsthesia.
J. S. Clements.....	Wisconsin.....	Deposits on the Teeth.
J. G. Reid.....	Indiana.....	Diseases caused by Decayed Teeth.
T. C. Kern.....	Nebraska.....	Deterioration of Teeth.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE twentieth annual commencement of the Pennsylvania College of Dental Surgery was held at the Academy of Music, Philadelphia, Saturday evening, February 26th, 1876, at eight o'clock.

The address to the graduates was delivered by Professor George T. Barker; the valedictory by T. L. Taylor, D.D.S.

The number of matriculates for the session was eighty-five.

The degree of D.D.S. was conferred upon the following members of the graduating class:

NAME.	RESIDENCE.	THESIS.
John F. Benkart.....	Germany.....	Suggestions in Mechanical Dentistry.
William O. Butler.....	Illinois.....	Our Duty.
Randall Clunas.....	Scotland.....	Nitrous Oxide.
Isaac N. Demorest.....	Ohio.....	Caries of Teeth, Cause and Prevention.
Frank H. Gardiner.....	Illinois.....	Dental Caries.
Felipe Gomez.....	South America.....	Treatment of Caries.
Meyers Hellings.....	Pennsylvania.....	The Dentes Cuspidati.

NAME.	RESIDENCE.	THESIS.
Thomas M. Heiss.....	Pennsylvania.....	The Preservation of the Teeth.
Frank R. Jones.....	Pennsylvania.....	Anæsthetics.
Max Kahn.....	Russia.....	Anæsthesia.
Walter S. Leaming.....	New Jersey.....	Dentistry.
Benjamin F. Linn.....	Pennsylvania.....	Periodontitis.
James S. McCormick.....	Pennsylvania.....	Neuralgia.
William B. Miller.....	Pennsylvania.....	Primary Stages of Digestion.
Emiliano Marquez.....	South America.....	Preservation of Pulp.
Wallace C. Martin.....	Illinois.....	Maxillary Necrosis.
E. Hill Powell.....	Nebraska.....	Is Dentistry a Specialty of Medicine?
Joshua H. Pierpont.....	New Jersey.....	Circulation.
Albert C. Peck.....	Connecticut.....	Teeth.
Amos C. Rich.....	New York.....	Extraction of Teeth and Results Arising Therefrom.
Amos W. Rogers.....	Pennsylvania.....	Necrosis or Dead Teeth.
Louis E. Sage.....	Connecticut.....	Operative Dentistry.
Walter Seaton.....	Mississippi.....	Prosthetic Dentistry.
Henry S. Summers.....	Ohio.....	The Antrum and its Diseases.
Charles S. Tuller.....	Connecticut.....	Dental Education.
Thompson L. Taylor.....	Kentucky.....	Extraction of the Teeth.
Sidney H. Verbeck.....	New York.....	Wisdom in the Design of Nature.
Dr. Med. Adolph Weil.....	Bavaria.....	Hypodermic Injections.
Emanuel M. Wolfe.....	Pennsylvania.....	Anæsthesia.
James M. Winner.....	Pennsylvania.....	Dental Caries.
Thomas H. Whiteside.....	Pennsylvania.....	Irregularity of the Teeth.

PHILADELPHIA DENTAL COLLEGE.

THE thirteenth annual commencement of the Philadelphia Dental College was held at the Academy of Music, Philadelphia, on Friday evening, February 25th, 1876.

The address to the graduates was delivered by Professor D. D. Smith, D.D.S.; the valedictory by Henry W. Morgan, M.D., D.D.S.

The number of matriculates for the session was one hundred and five.

The degree of D.D.S. was conferred on the following graduates:

NAME.	RESIDENCE.	THESIS.
Conrad Allgoewer.....	Germany.....	Tongue and Glossitis.
James Walter Allen.....	Pennsylvania.....	Dental Caries.
J. Finley Baker.....	Illinois.....	Mechanical Dentistry.
Charles S. Butler.....	New York.....	Caries.
Charles I. Bailey.....	New York.....	Digestion.
Matthew H. Cryer.....	England.....	Teratology and Deformity.
George G. Cardwell.....	Pennsylvania.....	Gold as a Filling.
William A. Dartt.....	Wisconsin.....	Gold for Fillings.
Henry I. Dorr.....	California.....	Salivary Calculus.
Elof Förberg.....	Sweden.....	Secretion of Saliva.
Ferdinand Foerster.....	Pennsylvania.....	Orthodontia.
G. Osborne Hannah.....	New Brunswick.....	A Tooth-Pulp.
Ned M. Harry.....	Pennsylvania.....	Preparation of Teeth for Filling.
L. P. Holbrook.....	Ohio.....	What a Dentist owes his Patients.
George Hyde.....	Nova Scotia.....	Caries of the Teeth.
J. H. Heivly.....	Pennsylvania.....	Artificial Dentures with Continuous Gums.
James H. Keenan.....	Pennsylvania.....	Respiration.
Henry C. Longnecker.....	Pennsylvania.....	The Imponderable Agents.

NAME.	RESIDENCE.	THESIS.
Henry W. Morgan, M.D.....	Tennessee.....	Anæsthesia.
Charles F. Malbon.....	Maine.....	Alimentary Canal.
Frank McBeath.....	Wisconsin.....	Dentes Sapientie.
Edward P. McLean.....	Canada.....	Pain in Surgery.
Eben G. Murrah.....	Georgia.....	Digestion.
M. J. Noble.....	Ohio.....	Gold vs. Rubber.
Saml. W. Neall.....	Pennsylvania.....	Systemic and Pulmonic Circulation of the Blood.
J. Burekmyer Patrick, Jr.....	South Carolina.....	Orthodontia.
Charles S. Patrick.....	South Carolina.....	The Effects of Cheap Materials on Mechanical Dentistry.
Byron D. Palmer.....	Ohio.....	Alveolar Abscess.
Carl Remenovski.....	Austria.....	Inflammation.
Eugene G. Regennas.....	Pennsylvania.....	Mastication.
Henry A. Robbins, M.D.....	Dist. of Columbia.....	Constitutional or Secondary Syphilitic Ulcerations of the Mucous Membranes of the Mouth and Surrounding Tissues.
Henry Rea.....	Canada.....	The Blood.
Manuel Franco. Seiglie.....	Cuba.....	Consequences of Inflammation.
Maurice W. Steiner.....	Illinois.....	Anæsthetics.
R. Atmar Smith.....	South Carolina.....	Continuous Gum.
Miguel Ferreira da Silva.....	Brazil.....	Dezenvolvimento dos Dentes de 1ª Denticão e accidentes de Erupção.
C. R. Taylor.....	Illinois.....	Neuralgia of the Trifacial Nerves.
David Scott Thomas.....	Ohio.....	How to Practice Dentistry.
J. Otto Urban.....	Prussia.....	Odontalgia without Caries.
W. Armston Vice, M.B.C.M.....	England.....	Irregularities.
Gustav von Walther.....	Russia.....	Dr. Süersen's Obturators.
Jay Thomas Wardrobe.....	Wisconsin.....	Circulation.
Jackson Williamson.....	Pennsylvania.....	The Organs of Circulation.
I. Franklin Wardwell.....	Connecticut.....	Permanent Separations.

MARYLAND DENTAL COLLEGE.

THE third annual commencement of the Maryland Dental College was held in Masonic Temple, Baltimore, on Thursday evening, March 2d, 1876.

The address to the class was delivered by Dr. C. S. Hurlbut; the valedictory by R. M. Johnson.

The number of matriculates for the session was eighteen.

The degree of D.D.S. was conferred upon the following graduates by Dr. R. B. Donaldson, President of the Board of Regents.

NAME.	RESIDENCE.	THESIS.
Wm. F. Andrews.....	Massachusetts.....	Alveolar Abscess.
Charles E. Busey.....	Maryland.....	Continuous Gum.
Jas. H. Demarest.....	New York.....	Digestion.
Edward Duncan.....	Illinois.....	The Nervous System.
Jas. M. Gano.....	New York.....	Circulation.
Cyrus M. Gingrich.....	Maryland.....	Digestion.
Richard M. Johnson.....	North Carolina.....	Valedictory.
Ase P. le Brun.....	Paris, France.....	Hygiene.
Wm. F. Marshall.....	New York.....	Fifth Pair of Nerves.
John J. Williams.....	Maryland.....	Sixth-Year Molar.

NEW YORK COLLEGE OF DENTISTRY.

THE tenth annual commencement of the New York College of Dentistry was held at Chickering Hall, on Monday evening, February 21st, 1876.

Prof. Faneuil D. Weisse, M.D., addressed the graduates, and George M. Eddy, D.D.S., of the graduating class, was the valedictorian.

The number of matriculates for the year was seventy-nine.

The degree of Doctor of Dental Surgery was conferred by Dr. William H. Allen, president of the college, upon the following named gentlemen:

NAME.	RESIDENCE.	NAME.	RESIDENCE.
George H. Dunster.....	St. Petersburg, Russia.	Wm. H. Barnum.....	New York.
Charles Pullin.....	New Jersey.	Emanuel Voerner.....	Germany.
George J. Hartung.....	New York.	Monteith E. Close.....	New York.
George M. Eddy.....	New York.	Charles F. Rabell.....	New York.
Charles W. McCall.....	New Jersey.	Francis E. Pratt.....	Michigan.
Stuart H. McNaughton	New Jersey.	Luis Restrepo.....	United States of Colombia.
L. Chapman Smith.....	New York.	Eben M. Flagg.....	South Carolina.
J. Osbourn Edwards	Java.	Frederic D. Tomlinson..	New York.
Julio Lyon.....	Santo Domingo.	Henry DeVries.....	Connecticut.
Wm. C. E. Bergman	Germany.	Fred. H. Lee.....	New York.
George J. Pack.....	New York.	Albert J. Wright.....	New York.
Julius W. Dittmann.....	Germany.	Rufus G. Stanbrough....	New York.
Wm. D. Tenison.....	New York.	Alonzo B. Miller.....	New York.
David Engel.....	New Jersey.		

The theses consisted of written answers to a certain number (five) of questions put by each professor.

The faculty prize (a set of instruments valued at one hundred dollars) was awarded to George H. Dunster, of St. Petersburg, Russia.

NEW ORLEANS DENTAL COLLEGE.

WE are informed by Prof. A. F. McLain, dean of the New Orleans Dental College, that, owing to the fact of there being but one candidate for graduation, no commencement exercises were held.

The number of matriculates for the session was eight.

The degree of D.D.S. was awarded to Joseph M. Mason, of Macon, Georgia. Subject of thesis, "Dentistry."

DENTAL DEPARTMENT OF HARVARD UNIVERSITY.

At a meeting of the corporation and overseers of Harvard University at the close of the session of 1875-76, the university degree of "Dentariæ Medicinæ Doctor" was conferred upon the following graduates:

George Cunningham, B.L., B.Sc. (Paris), Edinburgh, Scotland; Charles Claude Rogers, M.R.C.S., L.D.S., London, England; Thomas Bradley, Holyoke, Mass.; George Peters Caldwell, St. John, N. B.; Jesse Robbins, Salem, Mass.; Julius George William Werner, Boston, Mass.; Ezra Fletcher Taft, Dedham, Mass.

The number of matriculates was thirty-five.

BOSTON DENTAL COLLEGE.

THE eighth annual commencement of the Boston Dental College was held at Fraternity Hall, Boston, Wednesday evening, March 1st, 1876.

Essays were read by James Carroll Whinery, Jacob Francis Foltz, and William Jarvis.

The valedictory was delivered by Harry Warner Coburn, and an address by Professor Stephen P. Sharples.

The number of matriculates for the session was twenty-four.

The degree of D.D.S. was conferred on the following graduates by Professor Isaac J. Wetherbee, president:

NAME.	RESIDENCE.	THESIS.
Leonidas Haskell Andrews.....	Massachusetts.....	Dental Education.
John I. Ballard.....	Ohio.....	Dental Tools and their Uses.
Harry Warner Coburn.....	Massachusetts.....	Who shall be Dentists?
Rolla Miner Chase.....	Vermont.....	Deciduous Teeth.
Samuel Eliphalet Emery.....	Massachusetts.....	Effects of Civilization upon the Teeth.
Walter Ernest Fay.....	Massachusetts.....	Mechanical Dentistry.
William Jarvis.....	New Hampshire.....	Dental Culture.
Leon Rideout.....	Massachusetts.....	Dental Etiology and Prophylaxis.
Millard Warren.....	California.....	Anæsthetics.
James Carroll Whinery.....	Ohio.....	Dental Caries.
Charles H. White.....	New Hampshire.....	Dental Caries.

MISSOURI DENTAL COLLEGE.

THE tenth annual commencement of the Missouri Dental College was held in Temple Building, St. Louis, March 10th, 1876

The valedictory address was delivered by Professor E. H. Gregory.

The number of matriculates for the session was thirteen.

The degree of D.D.S. was conferred upon the following graduates by Professor W. H. Eames:

NAME.	RESIDENCE.	THESIS.
Peter B. Mathiason.....	Missouri.....	Nitrous Oxide Gas.
Chas. C. Buckner.....	".....	Operative Dentistry.
Alfred R. Reed.....	".....	Antrum Highmorianum.
J. Ward Hall.....	".....	Practical vs. Theoretical Teaching in Dental Colleges.

EDITORIAL.

TO THE DENTAL PROFESSION.

THE American Academy of Dental Science, Boston, Massachusetts, design presenting to the profession and the public at the approaching "Centennial" a view of American dentistry, past and present.

One of the characteristics of this presentation will be a history of the profession in this country, particularly for the past one hundred years; this work being designed to become a standard of reference, will be comprehensive and complete in detail.

To the end that this desirable result may be attained, the committee in charge respectfully request the aid of all dentists (and others) in furnishing information of every kind necessary to the work. Below will be found a list designed to afford a general idea of the kinds of information needed; and on these and kindred subjects, and indeed on *any* subject connected with the profession, nothing will be regarded as too small or insignificant to be of value. If desired, any material received will be carefully preserved and returned to the sender after use. To facilitate this, as well as insure credit being properly given, everything should be marked with the name and address of the sender.

The committee are persuaded that the importance of such a work to the profession can hardly be overrated. Several small works, able so far as they extend, have been put forth; but, as yet, nothing on the scale laid out for this work has appeared. The committee feel assured, therefore, that they can rely on the hearty co-operation of the profession in furnishing the information above mentioned.

Local Committee.—Dr. J. L. Williams, Chairman, No. 1 Mount Vernon Street, Boston; Dr. D. M. Parker, 132 Boylston Street, Boston; Dr. Joshua Tucker, Hotel Boylston, Boston; Dr. E. G. Tucker, Ashburton Place, Boston; Dr. T. H. Chandler, 222 Tremont Street, Boston; Dr. E. N. Harris, 597 Tremont Street, Boston; Dr. W. W. Codman, 33 Boylston Street, Boston; Dr. L. D. Shepard, Hotel Boylston, Boston; Dr. F. N. Seabury, Providence, R. I.; Dr. H. F. Bishop, Worcester, Mass.; Dr. G. T. Moffatt, Secretary of Committee, No. 1 Hotel Boylston, Boston.

Advisory Committee.—Dr. D. Harwood, Boston; Dr. A. L. Northrop, New York; Dr. W. W. Allport, Chicago; Dr. P. H. Austen, Baltimore; Dr. R. Arthur, Baltimore; Dr. J. H. McQuillen, Philadelphia; Dr. Edward Maynard, Washington; Dr. N. W. Kingsley, New York; Dr. J. Taft, Cincinnati; Dr. E. B. Gardette, Philadelphia; Dr. J. S. Knapp, New Orleans; Dr. J. W. White, Philadelphia; Dr. H. S. Chase, St. Louis; Dr. S. A. Bemis, Boston.

List of Subjects.—Biography, Literature, Societies, Colleges, Individuals, Mechanical and Operative Dentistry, Discoveries in any branch of the Profession, Materia Medica, Prominent Events (with dates), Prominent Questions, Inventions, Patents, Anecdotes, Sayings, Historical Facts, Obituaries, Addresses, Papers, Published and Unpublished Works, etc., etc.

Address communications and material to Geo. T. Moffatt, M.D., No. 1 Hotel Boylston, Boston, Massachusetts; or to James E. Dexter, care W. A. Bronson, M.D., No. 8 East Thirty-fourth Street, New York City.

PERSONAL.

DR. W. C. HORNE, formerly of New York, has established himself in the city of Rome, Italy, in the practice of his profession. His address is 66 Via di Condotti, corner of Via di Boca di Leone.

TEMPERAMENT IN THE TREATMENT OF THE TEETH.

In answer to numerous letters of inquiry in relation to the subject of temperament as connected with dentistry, Dr. J. Foster Flagg requests us to say that there are no works from which other than general information can be obtained. O. S. Fowler's work on Phrenology contains much that is interesting on the subject.

BIBLIOGRAPHICAL.

TRANSACTIONS OF THE AMERICAN DENTAL ASSOCIATION AT ITS FIFTEENTH ANNUAL SESSION, HELD AT NIAGARA FALLS, N. Y., August 3d, 4th, 5th, and 6th, 1875.

TRANSACTIONS OF THE PENNSYLVANIA STATE DENTAL SOCIETY FOR 1875.

WE have read these two documents with more interest and genuine satisfaction than is usually accorded to similar reports. They bear internal evidence of greater care in the preparation, and a commendable energy in working up facts. Associations have been amenable to criticism, in that the results furnished no equivalent to the efforts made in sustaining them. As exponents of the scientific culture of the profession they have been regarded as a failure, and this is especially true of the American Dental Association. Its plan of organization, whilst perhaps theoretically good, is, in its practical workings, exceedingly bad. It does not seek out and engraft upon its body those minds that have given evidence of scientific culture, but depends on chance addi-

tions of strength from material good, bad, and indifferent. Nor are we aware that any special care is taken in the selection of the committees. The result is, we have a fortunate hit and an unfortunate miss; a paper abounding with thought and original ideas, and one thrown together, apparently, with the only idea uppermost that something had to be written. It is not, therefore, remarkable that we find a jumble of original thought and crude ideas,—an admixture not always agreeable to listen to, nor creditable to the profession when brought to the crucible of exact scientific criticism. While these Proceedings are not exempt from this defect, they are, as a whole, extremely readable, and, to an exceptional extent, contain matter of great value.

It is a great relief to find the tendency of thought toward matters of a practical nature. We miss, with great satisfaction, the threadbare discussions on hackneyed subjects, in which theory supplanted fact, and ignorance knowledge.

The proceedings of the national association open with a paper by Dr. J. Allen on the "Exhaustive Effects of Dental Practice." This is a subject that has needed, and will continue to need, constant attention, and we are glad to find that it elicited a very interesting discussion, perhaps the most interesting of the entire series. We think Dr. Allen strains a point in giving the names of eleven prominent dentists who have died insane, and, by inference, referring this to over-exhaustion in practice. Habits of life have much to do with this, and unless these are known, conclusions cannot be formed. It cannot, however, be questioned but that the exhaustive process, long continued, must tend to physical and mental deterioration; and if dentists will continue to work from early morning until late at night, year in and year out, they must expect at an early day an entire break-down. Those who are wise limit their hours and lengthen their lives, and infinitely multiply their power to enjoy life.

The discussion of this subject is followed by a paper on "Histology and Microscopy," by W. H. Jackson, in which he says: "In examining hypertrophied cement we find it is frequently laminated, showing that there are times of great *activity of absorption*, followed by almost, if not entire, cessation of activity. . . . Often there may be observed a line . . . dipping down into the lamina beneath; . . . this line shows to what extent resorption had taken place *before absorption began again to carry on its work.*" We italicize a portion that we consider especially objectionable, inasmuch as it is a dogmatic assertion of a process not at all proved, and rests, so far as we are aware, solely on the dictum of the writer.

Another article on the same subject takes up the investigation of Dr. Chase on the "baccated" appearance of tubuli. While not disputing isolated cases presenting such appearances, it has not been our good

fortune to meet with them, as represented. Several photographic plates are given, representing the histological features of teeth found in a dentigerous cyst removed by Dr. Morse, of Kentucky. This presentation is interesting, and reflects credit on the parties concerned; though we think the histological features could have been equally as well illustrated by one of the nine photographs given.

The report of the Committee on Dental Chemistry elaborates the views of Dr. Palmer, and those of Drs. Bogue and Hitchcock. The question of electrical action, as explained by Dr. Palmer, is of vital interest, and we are pleased to find it received the attention its importance demands.

But space will not permit us to follow, in a review, all the papers presented, nor would it be of general interest to our readers. Mechanical and operative dentistry received their usual share of attention, and dental education, the shuttlecock of the profession at the present time, came in for learned and unlearned disquisitions. If outsiders were to judge of dental literature by the report on that subject, they would naturally conclude that dentistry was truly a contracted field.

The "Transactions of the State Society" we regard as superior to those ordinarily issued; but some of the articles are open to criticism. The "spread-eagleism," if we may use a slang term in this connection, is so apparent in some that we cannot forbear a protest. We exclude from this category the able articles of Drs. Peirce, McQuillen, and one or two others, but we think the following quotation will illustrate fully our idea of objectionable writing: "During all this time we have stood and worked out a brilliant destiny as a profession, with all the appliances, colleges, literature, and associations of a profession, and progressed to such a degree that does not only *awaken the admiration of the world*, but that *challenges the respect of all nations* to such an extent as to have made the American dentist the leading practitioner, and his education a *passport to the confidence of the highest respectability and the first families of the finest communities in every civilized country*." The italics are ours. We have had entirely too much of this kind of talk. It betrays a lamentable ignorance of the work done abroad. If members of the profession would only make themselves more conversant with the journals of England and Germany, their cheeks would glow with mortified pride at the comparison necessary to be drawn. In practical work we have no superiors; but of our scientific culture the less said the better will it be for our humility.

It seems to us that it is high time the associations should bend their energies to the weeding process, regardless of men or the positions they may occupy. It may be well enough to issue on the title-page a "disclaimer," but does responsibility cease by this? We think not. At all events the scientific mind the world over will read, and in read-

ing must conclude that American dentistry is a puzzling muddle of incongruities. We hope to see the time when publishing committees will exercise the same power as the editor of a journal, and eliminate, where elimination is necessary, without fear or favor. *

PERISCOPE.

DENTAL CARIES.—Dental caries, or decay of the teeth, is perhaps the most universal affection afflicting mankind, and when it is considered that the disease is often originated or aggravated by derangements of the general health, and that, on the other hand, in addition to the pain with which it is accompanied, it is the means of inducing various local and constitutional disorders, it will be admitted that the subject is one of interest to every practitioner. Like many other diseases, its nature has been the subject of much controversy, owing to the imperfect knowledge of the anatomy and physiology of the part; but in later years, by means of the microscope, extensive investigations have been made, and the precise structure of the teeth has been unmistakably determined. The theory of the etiology and pathology of dental caries which I am about to explain is entirely based upon generally admitted facts; it is that which I believe can alone be arrived at by reasoning upon such facts; it is that which has been adopted by the best authorities, and eventually must be, in my opinion, universally accepted. It will be perceived that decay of the teeth is a process entirely dissimilar to caries of bone, and that although the term caries is retained for the sake of convenience, it is not really indicative of the true character of the disease.

Caries, or decay of the teeth, consists essentially of a process of gradual softening and disintegration of the tissues, due mainly to the action of acid. The onset of the disease is favored and its progress hastened primarily by certain structural defects in the enamel and dentine; and secondarily, by some diseases of the oral mucous membrane and some derangements of the general health. The progress of the disease is accompanied by pathological changes in some of the tissues affected by it. Commencing invariably at the exterior, it advances towards the interior of the tooth, forming a cavity, which increases in size until the crown and even the greater part of the root also are destroyed. It is attended with pain, which often commences in a mild form as soon as the dentine is slightly penetrated, and becomes most severe when the central cavity is laid open, and the pulp being exposed to the action of external irritants and to injury becomes the seat of inflammation.

The acid, the active agent in caries, may be derived from several sources. It may be secreted by the mucous membrane. The normal secretion of the membrane is small in quantity and slightly acid. In health the acidity is at once neutralized by the alkaline saliva with which it mingles; but when the membrane is congested or inflamed the mucus increases in quantity and becomes more strongly acid in character, and is sufficiently powerful to slowly dissolve the dental tissues. This may be proved by experiment. If a small pellet of cotton-wool or other foreign substance be forced between two teeth and

left so as to press upon the gum, the secretion from the mucous membrane at that point will be found in the course of a few hours increased in quantity and strongly acid. If this irritation be kept up, it will be seen after a short time that the enamel adjacent to the acid-secreting surface is undergoing slow solution.

During the decomposition of particles of food, which, mingled with shreds of mucus and other such substances, lodge about the teeth, acid is formed which is capable of producing an effect exactly similar to that just described.

Caries may commence on a sound unbroken surface of the tooth, especially on the lateral aspects, close to which acid is commonly generated by decomposition of particles of food and irritation of the mucous membrane. It frequently has a starting-point at some part of the enamel and dentine, the seat of structural defect. Imperfections in structure, from which few sets of teeth are altogether free, may be owing to defect either in the quantity or in the quality of the tissues. Defects in quantity consist of pits and fissures in the enamel and dentine. These vary in extent between minute cracks perceptible only under the microscope and cavities plainly visible to the naked eye. They may penetrate the enamel alone or may extend to a greater or less depth into the dentine also. Their most common situation is in the depths of the natural depressions in the contour of the tooth, as, for example, between the cusps of the molars. Fissures which involve the dentine as well as the enamel are the most favorable to the attacks of caries.

Defects in the quality of the tissues may affect the whole body of the tooth, or may be confined to certain spots in the enamel and dentine. The fact is well known that the durability of the dental tissues varies considerably in different individuals; in one the teeth withstand the extremest hard usage combined with neglect; in another they show traces of disease within the earliest years of childhood, and are destroyed sooner or later even in spite of active treatment. If the enamel and dentine of such delicate teeth be examined, it will be found that they present well-marked evidences of imperfect formation. The enamel, instead of appearing a densely hard, almost homogeneous mass, is comparatively soft, owing to imperfect calcification, and porous in consequence of incomplete coalescence of its formative elements. It retains a marked fibrous character. The fibers are imperfectly blended, their transverse striæ are clearly evident, and they are often penetrated at their centers by tubes or small cavities. At parts the fibrous character may be altogether lost, the tissue consisting of an incompletely united granular mass.

The dentine, in addition to undue softness, exhibits throughout its structure, and especially immediately beneath the enamel, patches of interglobular substance, such as in well-formed teeth exists only at the point of junction with the cementum. In the spaces of the interglobular substance the tubes end, or they may even run on and terminate in dilated extremities within the substance of the enamel.

It does not always happen by any means that all the structural defects which have been just mentioned in the quantity and quality of the dental tissues exist together in one tooth. Their degree and character vary considerably. It is not uncommon to find in teeth of otherwise good organization one or two pits or fissures, or small patches of

defective tissue; whilst in teeth of generally inferior structure there are often to be discovered portions of still feebler formation.

The local and constitutional diseases which favor the onset and progress of caries are those which are accompanied by or which tend to aggravate inflammation of the oral mucous membrane, and those which give rise to the formation or deposit of acid within the mouth. Among the former may be particularly enumerated all the varieties of stomatitis; among the latter scrofula, syphilis, phthisis, chlorosis, and chronic alcoholism. These constitutional affections exert their baneful effect upon the teeth in great part by reason of the chronic inflammation of the gums and vitiation (even general acidity) of the secretions of the mouth, and the dyspepsia with which they are all so commonly accompanied. For the same reason caries is frequently active during pregnancy. During febrile diseases, in which the secretion of saliva is scanty and the teeth remain coated with sordes,—accumulations of epithelial scales, viscid mucus, and other foul secretions,—caries, as might be expected, is often originated, and, when previously present, is always accelerated.

The facts that enamel and dentine are readily soluble in the acids, the presence of which in the mouth commonly arises from various sources, and that structural defects in the enamel and dentine not only furnish places favorable for the lodgment of acid substances, but at the same time render some portions of the teeth more readily acted upon than others, suffice to explain both the origin of caries and the reason why the disease commences at certain isolated spots and does not affect uniformly and at once the entire surface of the crowns of the teeth.

The physical signs of caries, consisting mainly of discoloration and softening of the tissues, bear a general resemblance in every case. They differ only in consequence of the mode of onset, the situation, and rapidity of the disease. The discoloration in the incipient stage on an unbroken surface of enamel usually amounts to no more than slight opacity of that tissue,—a condition which also, as a rule, prevails throughout the later stages on the borders of the cavity of decay. When the disease begins in a fissure, and when a cavity is formed, the discoloration is more marked, the softened dentine assuming a brown tint, or becomes stained to a blackish hue by decomposition, aided by the entry of foreign substances and by the deposit of the peculiar fungoid growth, the *Leptothrix buccalis*. Cavities in which the disease extends deeply and is progressing rapidly show least discoloration.

The softening or disintegration perceptible in the successive stages of the disease varies considerably. When a surface of enamel is first affected it appears eroded, rough, and full of small holes, and is readily scraped away by a steel instrument. When the mischief has commenced in a fissure, but little softening may be apparent for a time at the surface, until later the undermined enamel, breaking down or being cut away, discloses a cavity in the dentine filled with disorganized tissue. Such a cavity is formed in every case in the later stages of the disease. Carious cavities are often cone-shaped, the apex of the cone being at the surface. This form of cavity (which more particularly arises where a fissure has previously existed) is due to the more rapid disintegration of the deeper than the superficial parts. The former are kept in intimate unceasing contact with the acid-generating contents of the cavity, whilst the latter are as constantly washed by the alkaline saliva. Then, again,

when caries penetrates to a mass of interglobular substance, it is easy to understand how the disease advances with greater rapidity at that point than at the superficies. The differences in the physical characters of the disease have given origin to such distinctions as spreading, penetrating, soft, and hard caries.

Microscopical examination of carious teeth shows that the action of the acid is more energetic in some elements of the tissues than in others. Thus, in the enamel the central portion of the fibers is, as a rule, the first to be removed, whilst in the dentine the intertubular substance and the walls of the tubes are the first to disappear, leaving the sheaths and fibrils—the animal basis of the tissue—to become subsequently decomposed and destroyed. The tubes at the later stages of the disease appear dilated and present occasional varicosities. Besides the disintegrated tissues and foreign particles, there is to be found by the microscope in most carious cavities abundance of the peculiar fungoid growth, *Leptothrix buccalis*, similar to that which is deposited upon the surfaces of the teeth in all mouths in which the most extreme care is not taken in frequently cleaning the teeth. The leptothrix assumes the appearance of minute threads projecting from the surface of the carious dentine in enormous numbers. It enters and occupies the disorganized and dilated tubes, forming a molecular mass therein, and it penetrates the tissue in every direction in which the calcareous salts have been removed. It has been supposed by some few observers that the leptothrix, if not the exciting cause of the disease, takes the principal part in promoting the advance of caries. There is no more than the slightest evidence to support the former part of this opinion, and but little to substantiate the latter. It can be conceived, however, that the growth may have some share in hastening the destruction of the already decomposing tissues.

Examination of carious teeth in various stages of decay demonstrates the fact that certain changes apparently take place prior to actual disintegration in that portion of dentine through which the disease is advancing, and which is situated immediately contiguous to the already disorganized tissue. This altered dentine has a translucent appearance, and forms either a regular zone or exists in isolated patches around the walls of the cavity. The appearance was once thought to indicate invariably a vital or pathological action, a natural effort to arrest the disease by calcification of the dentinal fibrils similar to that which occurs as a natural phenomenon as age advances. Such a change does doubtless really occur in some cases, especially in slowly-advancing caries in teeth of good formation, and it renders the tissue harder and better able to resist the progress of decay, and even sometimes to arrest it altogether. It is found, however, that a precisely similar translucent appearance is always produced during the gradual softening of dentine by acid, and to this softening, and not to consolidation, the appearance in caries is due in the majority of instances.—*Henry Sewill, M.R.C.S., in Medical Press.*

THE DENTAL NERVE-PULP IN LIFE AND DEATH.—After a few words by way of preface, Mr. Hutchinson said he would premise that fully nine-tenths of their surgical practice, apart from mechanical work, involved some treatment either directly or indirectly of the dental pulp. *Indirectly*, even in simple cases of stopping, where the nerve so called was not exposed, the dentine through its influence was allowed to be more

or less sensitive. *Directly*, the treatment of the nerve, its exposure, and its death, as the result of alveolar abscess gave more anxiety and trouble to patient and operator than any other branch of the dental calling, save and except the treatment of cleft palate. He then dealt with the subject under the following heads of:

1. Sensitive dentine.
2. Nerve near and tender.
3. Nerve exposed in excavation.
4. Nerve exposed by disease.
5. Inflamed nerve.
6. Suppuration and sphacelus.
7. Alveolar abscess, acute and chronic.

He did not think that sensitive dentine, except in certain situations, deserved the importance frequently attached to it by writers on the subject, and he held that there was very seldom need to resort to remedial means for its relief, except by two methods. One was, after preparing the cavity until healthy bone was reached, instead of continuing the torture, to stop the cavity with an osteoplastic material, enjoining the patient to return in three months. In other cases where the cavity was on the buccal surface or near the neck, a certain means of relief of the exquisite tenderness was to apply arsenic and carbolic acid to the cavity on blotting-paper, sealing it with wax; it was of the last importance not to use it for more than thirty-six hours, and, as far as his experience went, he deprecated as much as possible the use of arsenic. The removal of horny masses of disorganized dentine in large cavities was often agonizing, and might be made easier for the moment by applying pure carbolic acid, though a sharp excavator would do the work effectually without. In troublesome cases it was better to delay gold-stopping, preferring to use gutta-percha, and spreading a small piece of lead over the situation of the nerve. After giving a hint as to the method of inserting gutta-percha in cavities, he went on to consider the question of the exposure of the pulp, and mentioned a mode of treatment made known to him by the late Mr. Sercombe, whose intention it was to have brought the matter before the society. Mr. Sercombe's plan was to cut a small piece of pattern lead the size of the floor of the cavity, and on it to place some morphia, moistening it with creasote; he always mixed them on the lead, but he (the speaker) kept the paste ready made. Mr. Sercombe used the lead flat, but he (Mr. Hutchinson) burnished it into a saucer-shape, very shallow in the middle, then, with rubber dam in place, applied the lead with the paste over the exposed nerve; then with osteo, mixed soft, he proceeded to fill the cavity, the pressure of the instrument communicated through the stopping serving to send the lead home all over the floor of the cavity. The object of having the lead saucer-shaped was to allow of the force being spent on the lead and not on the nerve. After the stopping was in, it might be varnished either with melted lead, wax, or solution of gum. It was wise to request to see the stopping in from three to six months, because it might want renewing, or the tooth might bear a harder filling. Still, he had seen cases treated in that manner quite satisfactory after eighteen months or two years. This class of cases, he admitted, could easily be treated successfully in various other ways, but not so painlessly, and it was invaluable in cases of irritated pulp. The osteo he preferred, as giving least pain, was that prepared by Gutensohn,

which he had used for a year satisfactorily, the free acid in the chloride being neutralized with magnesia. This plan of capping exposed nerves was capable of modification, whereby a tooth could be stopped permanently at one sitting, provided the pulp was healthy. This could be done with the lead and morphia, but instead of filling up the cavity with osteo, it should only be placed in a mass sufficient to cover the lead all over, adhering to the walls of the cavity all round, leaving, however, sufficient space and holding ground for a metallic filling. This would be a suitable case for amalgam, preferably palladium, which could be inserted so gently as not to press on the delicate pulp through its projecting layer of osteo, but gold would to a certainty set up mischief. He confessed the difficulty of dealing with the question of exposed pulp after inflammatory pain, and asked for a full expression of opinion of the members present on the subject; no hard and fast line could be laid down, except to condemn as much as possible the use of arsenic as an escharotic. At the first visit, if not too painful, some of the decay should be removed and one of the usual dressings applied, such as aconite and chloroform, carbolate of collodion, or the paste of creasote and morphia, for some days, until all pain had gone, painting the gums with aconite and iodine; finally, removing all decay, he would proceed to fill in exactly the same way as before with lead, creasote, and morphia, with osteo over these. About 80 per cent. of cases so treated had been successful, and those not so usually ended peacefully, the nerve in many cases dying without pain, or only gradually, and when the stopping was removed no sensitiveness remained, and the tooth was ready to be treated.—*Abstract of paper by Mr. Hutchinson, before the Odontological Society of Great Britain.*

DECOMPOSITION OF THE DENTAL PULP THE CAUSE OF PERIODONTITIS.—Professor Lister asserts that decomposition may be averted if the admission of putrefactive germs to the substance prone to decomposition be prevented. He regards carbolic acid as a substance which has the power of rendering these germs inert, and of shielding organic matter from those particles that would otherwise excite in it destructive changes. When the dental pulp dies, its tendency, if uninfluenced, is to become putrid. During this process much sulphureted hydrogen gas is evolved, which makes its way into the mouth through the opening which caries has usually made into the pulp-cavity.

But it may happen that this aperture is absent, either from decay not having extended so deeply as the pulp-cavity, or from the filling up of this opening by a particle of food, or by the operations of the dentist, as when the latter places a filling over an exposed nerve. Then, though constantly this gas is set free from the putrescent pulp, it can find but one road to escape,—*that* lies through the opening at the end of the fangs. While doing this, particles of the semi-fluid nerve *débris* are forced through the fang extremities into the socket in the alveolar process. The result that usually follows inoculation with putrescent animal matter occurs in this instance: inflammatory action is lit up around the fang, leading often to the formation of an abscess and the escape of pus through the alveolar process into the mouth.

The occurrence of this alveolar inflammation depends primarily on a purely mechanical cause, to wit, the expansive action of the sulphureted hydrogen gas shut up in the pulp-cavity, and if the opening at the end of the fang be obliterated, the putrid nerve may be locked up

in the tooth for years without causing any inflammation outside the fangs.

Periodontitis is sometimes regarded as the result of the extension of inflammation from the tissues within the tooth to those without: this does not appear to me to be the pathology of the condition. In nine cases out of ten I think it is caused by the injection into the socket of putrid particles from the interior of the tooth. On opening the pulp-cavity of a tooth around which periodontitis is going on, we find almost invariably the pulp dead and fetid. The act of opening the pulp-cavity will always relieve the alveolar inflammation, by allowing the gas to escape into the mouth from the interior of the tooth. Occasionally periodontitis occurs while the nerve-pulp is not decomposed. I have seen it result from the application of arsenious acid for the purpose of devitalizing the nerve. Carbolic acid, by preventing decomposition within the tooth, will prevent inflammation without, and I cannot but think that the objection existing to the use of arsenious acid has chiefly resulted from the non-use of this antiseptic after the pulp has been devitalized. After the latter process a filling, perhaps, is placed in the cavity, the interior of the tooth still containing shreds of dead animal matter, which soon decompose as the air with its accompanying germs has been admitted into the tooth, and ere long a putrescent globule is forced from the end of the fang, and periodontitis is lit up. The risk of the latter is obviated after the use of arsenic if the nerve be cleared out from the fangs, and the interior of the tooth plugged with wool and carbolic acid: over this the metal filling may be placed. The mode of treating periodontitis will be much modified if we admit its causation by imprisoned gas within the tooth; our object will then be by drilling through the crown into the pulp-cavity to afford a vent to the elastic vapor.

An opening being made, the decomposed contents should be removed and carbolic acid introduced. The vent-hole may be allowed to remain for the escape of gas; after a couple of months it may be plugged experimentally: if periodontitis is again caused the aperture must be again restored.

But the treatment of teeth chronically inflamed is unsatisfactory, and too often ends only in extraction. That it should do so is evident on consideration of what I believe to be the pathology of the condition; for what can it avail to apply palliatives to the outside of the tooth while the cause of disease remains? But patients will not always consent to extraction, and, failing that, the best thing is to open the pulp-cavity, and thoroughly carbolize the putrid contents.

In conclusion, one may generalize thus: Periodontitis, with rare exceptions, is caused by decomposition of the dental pulp, and if the nerve be in a putrefied condition it will cause periodontitis, unless (1) leakage into the socket be prevented by the senile change of obliteration of the terminal openings in the fangs, or (2) an opening exist through the crown into the pulp-cavity, allowing gas to escape into the mouth.—*Abstract of paper by Mr. A. W. Barrett, read before the Odontological Society of Great Britain.—British Journal of Dental Science.*

ON THE TREATMENT OF THE DENTAL PULP WHEN EXPOSED BY DISEASE, AND OF DEAD AND DISCHARGING TEETH.—*Gentlemen,*—Like many others, I have long endeavored to carry out operations for filling teeth with the preservation of their vitality:—the objections to the opposite

course I pointed out so long ago as the year 1860, in the first paper I had the honor of reading before this society. I have long aimed at plans of treatment which might as a rule be carried out at one and the same visit. Exposure of the healthy pulp in the process of excavating a tooth is so readily treated, and the conditions of the organ so different to those which exist when it is laid bare by disease, that we can hardly draw a comparison between the two cases; yet, if we are able to make the latter imitate the former by causing the exposed ulcerating and discharging surface to assume a healthy one, and then effectually protecting it from all external sources of irritation, we may surely hope for an equally successful result; and this object I thus attempt to bring about. I would select those cases which have been regarded as the least fitted for destruction by arsenic; viz., where we see the pulp exposed, crimson in color, and even granulating into the carious cavity beyond its normal limits. Clearing away as much of the softening dentine as possible, without inflicting any pain, I obtund the sensitive surface of the exposed pulp by freely applying to it crystallized carbolic acid rendered fluid by a few drops of chloroform. The surface being quite blanched, I take a small disk cut out from an address-card, immerse it in the strongest nitric acid, and lay it directly upon the pulp, a sensation more akin to discomfort than pain being felt. Should the exposed pulp have assumed a polypoid form, I may repeat the process once or even twice. After allowing the nitric acid to remain in contact for two or three minutes, I remove the disk, and neutralize the acid in the cavity with an alkali; after which, cap the surface with thick paper, moistened with carbolic acid; cover this with a coating of oxychloride of zinc, and when this has fully set, fill over with foil, amalgam, or Jacob's gutta-percha, according to circumstances. When I first adopted this process I always filled the tooth temporarily with the oxychloride of zinc, hoping that in a short time calcification of the pulp might take place; such, however, has never been my experience. It has always been found healthy, and covered only by the thinnest pellicle of tissue; and as I occasionally injured it in removing the oxychloride, I have latterly almost invariably filled the tooth permanently at once.

The next class of cases which may be permanently treated at the single visit are those where the pulp has lost a portion of its substance, some of it existing in the pulp-cavity, or at all events in its fang or fangs. To attempt to preserve the vitality of the pulp, or any portion of it, under these conditions, would no doubt be fruitless, and the best treatment is doubtless destruction by arsenic and fang-filling; but conditions may forbid running any risk of inflicting pain or the possibility of a second visit; under these circumstances, especially if the tooth be quite free from periosteal mischief, I should fill, leaving a drainage-duct; thus, if with foil, by retaining a small piece of polished iron binding-wire from the pulp-cavity to the exterior, and when the process was completed drawing out the wire with a pair of pliers, or, better still, by drilling a fine hole through the side of the tooth, and just below the free margin of the gum into the pulp-cavity. If with amalgam, cap over pulp-cavity, with disk of thick paper, and when filled pass through amalgam a fine-pointed instrument, no thicker than a small needle, until the paper is reached or just perforated, and then carefully remove the same. I invariably adopt this plan in molar teeth, where drilling into the pulp-cavity would be attended with risk of wounding the pulp, and

I always first apply to the pulp-cavity strong carbolic acid. Fillings thus carried out will generally last from four to seven years, but invariably the fillings do come out, through extension of the disease by the small amount of moisture which will find its way to the interior of the tooth; the result will much, I think, depend upon the size of the drainage-duct. I have found the smallest I could make always sufficient for the purpose. When a tooth thus treated after some years loses its filling, it will be almost invariably found that its cavities are quite free from any offensive contents, and on refilling require no drainage-duct.

A third class of cases are those in which the pulp is dead, and where there is purulent discharge from the pulp-cavity and offensiveness of the dentine itself. For these cases, generally difficult and tedious to treat, I think I can offer a plan which when tried will be largely adopted; the effective agent being arsenious acid; its antiseptic, not its escharotic, properties being those which here render it serviceable. Arsenic is probably the most powerful agent we possess for the prevention of putridity in animal substances; but as in the cases in question I have employed it with two others, viz., carbolic acid and chloride of zinc, the results may have been influenced by their presence also. The following is the method I adopt: Let it be a dead and discharging tooth, with even an unhealthy condition of the periodontum, so that it may be somewhat tender when bitten on. I clean out, as a rule, pulp-cavity only, wash out well with carbolic acid, and introduce a disk of card moistened with same and taking up as much arsenious acid as will readily adhere to it, and place it on the floor of the pulp-cavity over the orifice of fang or fangs, and either fill with oxychloride of zinc temporarily or pulp-cavity only, and the remaining cavity permanently.

I commenced this method of practice more than three years ago, and can call to mind no case in which the tooth so treated has given further trouble, except in a few which had not been bitten on for a considerable time, and which continued more or less sensitive to pressure; but when the periodontitis has been recent, and rather of the acute than the chronic form, I have always, I believe, succeeded in at least greatly lessening the pain and tenderness. In children I have found the plan, if anything, even more successful; on many occasions quite curing constantly-recurring gumboil; and I may confidently say I have never seen the smallest indications to lead me to suspect any injury has arisen from the employment of so powerful an agent; the *rationale* of the process being, I believe, the conversion of a putrid and irritating body, such as a necrosed (not merely devitalized) tooth must be, into an innocuous one, which, as we know in the case of a transplanted dried tooth, or an encysted bullet, may, though undoubtedly a foreign body, remain in contact with living tissues without exciting in them any strong disposition to either irritation or inflammation.—*Abstract of paper by Mr. Alfred Coleman, read before the Odontological Society of Great Britain.—British Journal of Dental Science.*

AN INTERESTING CASE IN DENTAL SURGERY.—A lady consulted me in November last under the following circumstances. She complained that for the last five or six months she had suffered continual pain night and day in the left side of the face, and more particularly on the top of the head. There was no toothache, nor could she identify the pain in connection with any tooth. Furthermore, a very careful examination of all the teeth on the affected side failed to detect the

slightest trace of caries. On the same side the first bicuspid tooth was absent, the second bicuspid was turned half round, so that the outer cusp was presented to the first molar and the inner cusp to the canine, and immediately over this tooth was to all appearances a very small piece of necrosed bone, quite firm, and the most minute investigation failed to detect anything in the nature of a tooth or stump. There had been no blow, no recollection of any fall, or injury of any character, that would account for it.

Upon my suggesting that it was a case that should come under the more immediate care of a surgeon than that of a dentist, she informed me that she believed there was the stump of a tooth there, for some twelve years previously a tooth grew out from the gum horizontally, and directly over the second bicuspid. This decayed very early, and broke off, leaving no after ill-effects.

Such a communication as this led, of course, to a further search for the missing fangs, without any corresponding success, when I determined upon an operation, the result of which proved satisfactory.

I made an incision over the second bicuspid, laying bare the alveolar process, and, placing my thumb against the lingual surface to prevent loosening the tooth, firmly pressed a straight elevator into the cavity by the side of the small portion of necrosed bone, when, without the slightest further movement of the instrument, two small fangs, joined together, evidently those of the first bicuspid, slipped into the mouth. The diagnosis of the case was now complete; the opening caused by this almost painless operation was plugged with cotton-wool saturated with styptic colloid, and the patient sent home, and ordered to remove the wool and frequently rinse the mouth with warm water.

Remarks.—This case calls for one or two remarks, the most important of which is the necessity for making very careful and even long examinations of all teeth when pain in the neighborhood is supposed to have its origin in one or more of them, before resorting to any extreme measures. In this case a very searching one had been instituted, and nothing could be found to indicate the cause of so much suffering. If the patient had failed to mention the fact of the early-decayed tooth (her age at the time of its decay being only fourteen), I do not see any justification for an operation on the part of the dentist; but having done so, and the partial knowledge of the patient that a stump was somewhere about, no doubt could exist as to the propriety of one, for in the absence of something being done at this period of the case, in all probability at some future time an operation of a more formidable character would have had to be performed to arrest disease that must have inevitably communicated itself to the surrounding parts. Another curious phase in the history of this case was the almost total absence of pain for nearly twelve years after the breaking off of the tooth, and the continuous agony for nearly six months previous to my attending her.

Dec. 5th.—I have this day heard from the patient's medical adviser, Dr. Sharpe, of Walsall, that she has made a complete recovery.—*Adams Parker, L.D.S., R.C.S., in The Lancet.*

SYPHILITIC AFFECTION OF THE SUBLINGUAL GLAND.—M. Fournier, the eminent Paris syphilographer, has submitted to the Surgical Society the case of a man, aged thirty, who presented a tumor of the floor of the mouth, which interfered with mastication and articulation. The patient had been treated by M. Fournier eleven years previously for an

infecting chancre, and this led to the suspicion that the enlargement of the gland might be due to syphilis. A specific treatment was at once begun, and the swelling rapidly disappeared. Some exception was taken to M. Fournier's diagnosis by several members; but M. Verneuil, who had to report on the paper, observed that the case was important, as syphilis was supposed to spare salivary glands, the mammæ, the ovaries, the thyroid gland, etc. He considered that more stress ought to be laid on the chronicity and appearance of the neoplasm than on the syphilitic antecedents, and that the rapid effects of the iodide of potassium were quite conclusive as to the nature of the tumor.—*The Lancet*.

ODOFORM—This therapeutic agent possesses in a wonderful degree the power of reducing inflammation, soothing pain, and rapidly healing excoriated and ulcerated surfaces, by whatever cause produced. As a topical application its healing and anæsthetic powers are unequaled by those of any known agent. I am daily using it in the form of suppositories in cases of acute vaginitis with almost magical effect, and even in inflammation and induration of the neck of the womb it has proved itself an invaluable agent in rapidly relieving pain, reducing inflammation, and softening and restoring indurated tissue to a normal condition.

I am also successfully using iodoform, in ointment form (forty grs. to one ounce ung. simplex), in painful glandular enlargements. It has, in my own practice, shown itself as efficient as iodine. In connection with the topical application of this agent I daily administer three one-grain pills, at intervals of four hours each. For all such ills as these, iodoform has accomplished much already, and is destined, as I believe, to be of greater benefit, in the hands of the physician, than any known remedy.—*J. H. Johnson, M.D., in Boston Journal of Chemistry*.

GELSEMIUM SEMPERVIRENS IN NEURALGIA.—This article, which has had reputation in this country for neuralgia, has attracted little attention in Europe. It has been recently tried at the Dispensary at Heidelberg by Dr. Jurasz, assistant physician, who has reported favorable results. Five minims of the tincture were given three times a day for three days to a man æt. thirty, who had been suffering for a week with neuralgia of the right supra-orbital nerve, which had resisted quinia and veratria treatment, and completely cured him. The same dose given for six days gave permanent relief to a woman who had had brachial neuralgia on the left side for more than a year and a half, and been treated with various other remedies without success.

Two other neuralgias of the fifth nerve were rapidly cured with five- and ten-minim doses; and a case of very severe sciatica on the right side in a man of sixty, which had completely disabled him and confined him to bed, was quickly relieved by eight-minim doses three times a day, and the patient was able in a fortnight to walk with a stick; the cure being completed by warm baths and the use of the constant current.

On the other hand, the gelsemium failed completely in two cases of muscular rheumatism, and in a case of long-standing hemicrania.

In no instance was any unpleasant effect observed, either on the circulatory or digestive organs; but the dose of twenty minims was never exceeded.—*American Journal of the Medical Sciences*.

DYSPNŒA FROM THE DROPPING OF A MOLAR TOOTH INTO THE TRACHEA.—Dr. Van Giesen presented a molar tooth with a history as follows: A patient, who was recovering from typhoid fever, had been suddenly seized with dyspnœa. When the doctor arrived the man was recovering from the attack. On examination of the lungs and larynx, no sign or cause which would give rise to such a symptom could be found. The patient had recovered by the next morning, but the dyspnœa returned about an hour after the doctor's visit. Dr. Van Giesen thought that a crumb of bread might have accidentally fallen into the trachea, but the patient's friends said that he had eaten no bread for some time. In the course of the day, while coughing violently, he expectorated a molar tooth. It was supposed that the tooth had been very loose, and had fallen through the chink of the glottis while the patient was asleep.—*Reports N. Y. Pathological Society, in Medical and Surgical Reporter.*

THE EMPLOYMENT OF ANÆSTHETICS IN DENTISTRY.—* * * I believe that chloroform in larger doses is wholly inadmissible in dental surgery, save in very exceptional instances; for nitrous oxide gas has many of its advantages and not so many of its dangers. But, having had considerable experience in the administration of the latter anæsthetic, I can unhesitatingly assert that it is by no means totally free from danger, and that the remark in a recent article in the *Journal*, that "the unauthorized use by unskilled persons of dangerous anæsthetics is a practice fraught with the utmost peril," applies to it as to all other narcotics. Nitrous oxide is frequently administered, not only by men whose ignorance would leave them utterly without resource should accident occur, but even by common assistants or servants. I will not speak of the utter want of professional delicacy shown by more respectable men who thus make use of it, but would call attention to the reckless way in which this agent is being made use of, whilst I would suggest that practitioners might, to a great extent, remedy the evil by warning their patients of the risk they incur in receiving this or any anæsthetic at the hands of others than those who are fully qualified by experience and a medical education to administer such agents with a minimum amount of danger.—*Hamilton Cartwright, in British Medical Journal.*

HINTS AND QUERIES.

C. B. M., "HINTS AND QUERIES," December, 1875, can dissolve the common black rubber-gum, used for dental plates, in benzine. A much neater article, however, is procured at hardware stores or where they mend clothes-wringers.—W. C. G.

WILL some one please give the best plan to harden plaster-moulds in celluloid work?—INQUIRER.

WILL not some one well qualified give us the manner of applying rubber dam in the various cases occurring in practice, and oblige those who have never seen it used?—F.

A HOME-MADE STYPTIC.—Having frequently noticed in the *DENTAL COSMOS* the reports of severe hemorrhage following tooth-extraction, and the difficulty experienced by the writers in arresting it, I am moved to suggest a remedy which has been uniformly successful in my practice for the last twenty-five years. It

has also to recommend it the fact that it is to be found in every well-regulated family, and is so simple that any person of ordinary intelligence can employ it successfully. Hence I recommend it to patients who have reason to fear such an occurrence, without any anxiety as to the result.

In all cases of hemorrhage following tooth-extraction so profuse as to require attention, the coagula must first be removed from the socket and surrounding parts. Then having at hand a saturated solution of common salt in pure cider vinegar and some fine lint (such as may be procured by scraping an old linen table-cloth), dip a portion of the lint into the solution and carry to the bleeding socket, previously cleansed, and gently pack it in until the place left vacant by the root or roots is entirely filled. Then lay a strip of muslin folded so as to serve as a compress over the lint, and request the patient to close the mouth and make gentle pressure upon it. In ten or fifteen minutes the compress may be removed, the lint being allowed to remain until nature casts it out.

In a case which occurred in my practice, on a simple examination being made with a lance to determine the propriety of extracting a broken tooth, an inferior molar,—the extraction not being attempted because of insufficient light,—the hemorrhage which followed and persisted during the entire night to an alarming extent was promptly arrested in the morning by the above application. I see no reason why it might not be resorted to in a more general way as a styptic.—THOMAS WARDLE, M.D., D.D.S.

PIVOT TEETH.—My *confrère*, Dr. Clapp, of Boston, has hit upon a very good plan of preparing a root preparatory to pivoting it. (*Vide* description in the January number of DENTAL COSMOS.)

In the spring of 1866, after my first course at the Baltimore College, I was called upon to pivot a very badly-decayed root. The circumstances of my patient calling for a cheap and quick operation, I hit upon the expedient of filling the root thoroughly with tin-foil; then bored a hole into the tin and fitted and inserted an artificial crown on a hickory pivot. Having lost sight of my patient immediately after, I had no means of satisfying myself of the results of the trial.

Some time later, about four years ago, a similar case presented itself; but this time instead of tin I used cohesive gold, and performed the operation substantially as described by Dr. Clapp. At last accounts, about a year ago, this tooth was doing well, and promised to be useful for many years to come. Having since, to some extent, become a convert to the judicious use of amalgam, I have used this material for the same purpose in very frail and rickety roots, and have found so far that it answers well.

In these days of labor-saving machines the operation is comparatively simple and easy, and, I think, more practical than, and fully as efficacious as, the various modes described in the books and by vain theorizers in the dental journals.—BOYD A. DOREMUS, D.D.S., *Neuchâtel, Switzerland*.

MESMERIC ANÆSTHESIA.—A lady came to my office, after having broken two engagements, to take an anæsthetic, and said, "Have you any objections to extracting teeth for me while under the influence of mesmerism? Prof. W. offers to mesmerize me." I gave my consent. He took a position in front of the patient, and after a few gentle strokes of his hands over her face, motioned to me that all was ready. Six teeth were extracted before she left the chair. She expressed herself as not having felt the least particle of pain.

I do not remember of ever having had so timid and nervous a patient. While making the preliminary examination she would not allow me to use an excavator.—J. C. HENRY, *New Albany, Indiana*.

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, MAY, 1876.

No. 5.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 174.)

Occupation.—It has been found by experience that the occupation in which individuals are engaged has a marked influence upon the success or failure of attempts at pulp conservation. This is due to the greater or less exertion which is necessary for the prosecution of an avocation; as violent exercise would produce that general vascular excitement, together with corresponding systemic depression, which would necessitate the consumption of an amount of force for the establishment of normality that would seriously interfere with such nicely balanced functional action as is required in the effort under discussion.

It is also due to the proportionate amount of untoward position which has to be assumed, in which, from recumbent posturing or straining torsion of the head, the flow of blood is greatly increased toward the teeth by gravitation, or by impeding the free venous discharge of engorged vessels.

Also, to the surroundings which occupation entails, as to the prosecution of the daily duties under the invigorating influence of out-door air or in properly-ventilated apartments; or, under the atonizing control of heated, poorly-ventilated apartments, containing an atmosphere vitiated from contaminating fumes or exhalations.

Also, to the degree of mental anxiety which is inseparable from occupation,—those callings which draft heavily in this direction, showing quickly their irritating tendency, and proving, by their temporary abandonment, or even partial abnegation, and consequent subsidence

of objectionable symptoms, that this was indeed the power being exercised for harm.

Mode of living.—This has its decided bearing upon the operations instituted in favor of dental pulps, just in proportion as it is strengthening or weakening; irritating or soothing; luxurious, healthful, or penurious; nutritious, or a mere pandering to the palate.

It is something remarkable to note the difference in results of "almost-exposed pulp" cases, particularly in children, where seemingly nothing except mode of living will conjoin with temperament in the final decision of success or failure.

With *any* given temperament, and with other average attributes, those children whose mode of living is regular as to rising and going to bed; regular as to the eating of good, nutritious, palatable food; regular as to study and play; regular as to governance and educated to a degree of self-control, are the little patients from whom we can almost invariably hope for our successes.

On the contrary, those who rise almost at their own pleasure, go to bed only when fretful somnolency has so exhaustively irritated the whole nervous system that peevish crying usurps the place of the cheerful, sweet "good-night"; who eat at irregular hours, and partake, for the most part, either of that which their fancy dictates, or are the compulsory consumers of that which happens to be most convenient; who study incessantly from a morbid desire to obtain the cherished "marks" of superiority over their schoolmates or to gratify the foolish, wicked, parental pride of those who are innocent only in their ignorance of the injury inflicted upon their offspring; or, whose whole life of childhood is passed in that indulgence of frivolous pastime which can in no wise take the place of healthful recreation; who are thought to be governed by fitful attempts at control, and who, in reality, govern every one of the household except themselves; these are the little patients for whom our most skillful efforts will eventuate in our most signal failures, and for whom our dental hopes are, mainly, hopes to be blasted.

Influences so marked as these, in childhood, cannot be supposed to lose power, except in degree, with maturing years; and thus it is that we should always recognize their bearing as exerting some control in our final decision as to advisability of pulp devitalization, or attempted preservation, in cases of "almost" or "complete" exposure.

Place of residence.—This consideration is one which, until recently, has had little place in the discussion of this subject, but as comparative success in "capping" (as it is termed) has been reported by some practitioners, in contradistinction to a preponderance of failure reported by others, generally recognized as equally skillful, it was deemed important that this discrepancy should be explained.

It soon became apparent that locality had much to do with these statistics, and it has come to be regarded that the generally depressing influence, be it miasmatic, or whatever else, which tends to produce diseases of a periodic type, is markedly adverse to pulp conservation. Those afflicted with chills and fever, periodic neuralgia, periodic headache, and the like, are almost universally unable to have the vitality of even almost-exposed, to say nothing of exposed, pulps preserved.

The best that is possible in such cases is, usually, the maintenance of a lingering existence, enduring for two or three years, accompanied, perhaps, with occasional reminders of trouble in the form of toothache, and possibly with no other sign or symptom than a gradual loss of translucency of tooth, and an equally gradual supervening of the accustomed cloudy darkening which follows the death of even the bulbous portion of the pulp.

So decidedly does this endemic cause of disease prove its adverse influence over dental pulps, that it frequently occurs that a short sojourn in places where it exists will produce sufficient systemic effect upon patients to evoke unbearable paroxysms of pain in capped pulps which, perhaps for months previous, had been doing well under the auspices of more propitious localities.

It is this consideration which should be carefully remembered in the treatment of pulps, which, *capped by others*, come, in the mouths of "visiting" patients, to obtain relief at the hands of practitioners resident in less salubrious sections.

I cannot recognize any degree of leniency as too great toward such pulps,—it is all-sufficient that soothing, pain-obtunding medication be indulged in, *unless this is insufficient to afford the desired relief*. By no means should the attempt be regarded in the light of a failure, and, above all, by no means should any devitalizing agent be summarily applied; for it might be that with the relief of pain, the return home of the patient would sufficiently restore the usual systemic condition to permit of easy maintenance of vitality of the pulp and the consequent exemption from all the possible sequences of the opposite condition.

Should this, unfortunately, not be the result of palliative treatment, it will, at least, afford the operator under whose charge the patient will usually come the opportunity for conducting the case to its inevitable termination, and of thus assuring himself of that knowledge in relation to it which will almost positively be made subservient to some future relief from suffering.

I have said that it is sufficient that soothing applications be made, unless they are found to be insufficient to afford relief, but I desire to impress the fact that with the same adynamic condition which permits the disturbance of the pulp we cannot usually hope for good results

from topical applications alone; therefore it may be desirable, and sometimes is imperative, that constitutional treatment be directed to the end that the local medication shall produce a proper response.

For this purpose some general tonic, such as the mild gentian or quassia, or, perhaps best of all, boneset; or the stronger decoctions of bark, or even nitro-muriatic acid, may be advantageously employed, either alone or in combination with the usual decided anti-periodics, quinine, arsenic, capsicin, chinoidine or salicin.

While, however, we recognize the valuable aid thus afforded, it is important that we should not be deceived by the hope that this alone might be sufficient; for although it is possible that it *might*, yet the anatomical consideration of the pulp surroundings would point to that which would prove, in turn, irritant rather than permissive of any advance toward restoration of normality.

The unyielding character of the parietes of the pulp-cavity would alone be sufficient to demand the making of every effort, both local and constitutional (but most decidedly for local treatment), in order that the greatly disturbed functional action might have its equilibrium restored as promptly as possible.

Thermal changes.—Under this head we shall discuss that which is probably the most prolific cause of failure in connection with the attempted conservation of almost or completely exposed pulps.

The irritating effect of heat and cold upon pulps of teeth has necessarily been alluded to upon several occasions already, and it is palpable that just in proportion as proximity to these organs is permitted by decay or otherwise, so will thermal changes be increasingly detrimental.

It was in recognition of this fact that the earliest and crudest efforts were made for the preservation of pulps; indeed, I think that I might, without fear of contradiction, assert that it was in obedience to this recognition that the most consecutively successful operations for this purpose were performed.

For more than forty years this subject of "thermal changes" has attracted the attention of our profession; so numerous were the comments upon it from patients; so numerous were the occasions for the removal of fillings during the days when foil alone was used; so numerous were the comparisons between gold and tin in this connection, that "non-conduction" is a theme cotemporaneous with the "key" for extraction, and the employment of carvings of ivory for artificial dentures.

And yet to-day it is none the less interesting; as we have steadily progressed in our attempts to control nearer and nearer approaches to pulp-structure in teeth less and less able to resist disease, so suggestions have been multiplied in this direction, until many have passed

into oblivion, and occasionally well remembered old ones are actually presented as something new.

In combination with every application, be it stimulant, antiseptic, soothing, or simply mechanical, the idea of non-conductivity has always been embraced.

This could scarcely have been possible were it not accepted that deviations from a normal temperature, and much more, extremes of heat and cold, are exceedingly and especially injurious to the dental pulps.

This being the case, it behooves us constantly to bear the fact in mind, never to leave unperformed our share of duty in this direction, and never to weary of impressing upon patients the importance which we attach to this matter, and the necessity for their faithful and long-continued assistance in behalf of our efforts for their comfort and future dental welfare.

In concluding remarks upon this important topic, I would say that it is not alone such immediately and tangibly irritating hot and cold applications as are made to these pulps by what is taken into the mouth as food or condiments; or as the means of cleansing the teeth, as cold water; or as chilling drafts of cold air breathed rapidly through the open mouth; but that frequent and continued exposure to the enervating stimulation of the summer sun, as well as the shock given by the injudicious indulgence of cold general applications, as *cooling* by cold winds or cold baths, will so affect systemically as to react adversely, and sometimes with marvelous directness, upon an otherwise quietly-disposed pulp; therefore the necessity for prudence in this direction should be mentioned to patients at the same time that are given the usual and stereotyped cautions in regard to avoidance of undue hot and cold applications in the mouth.

Barometric changes.—In these we have a source of trouble which, although sufficiently capable of almost any amount of irritation, is, nevertheless, overlooked to an extraordinary degree.

This is probably due to the tendency, which is even yet observable, toward localizing dental disease and isolating it from its general connections. For both patient and practitioner it is too often only the tooth which aches, and only the tooth which needs attention. Forgetful of the fact that the toothache has so deranged the entire nervous system, and, consequently, everything under its control, as to make it impossible to attend to any business, prevent any recognition of the claims of hunger, preclude the possibility of any sleep other than that of sheer exhaustion, and, in short, make life a seeming burden, it is still an apparent local trouble, which is regarded only from the local stand-point, and relieved by the local application of a medication, or possibly by the most tangibly local operation of extraction.

This practice may answer the requirements for a certain amount of demand, but when one has exhausted all local medication, and has sufficient reasons for not resorting to extraction, if it can possibly be avoided, then it becomes necessary most fully to appreciate that if local trouble can thus cause such serious general disturbance, inversely a general excitant like barometric changes, classed as a "cognizable agent" of disease, should certainly have its full recognition as liable to produce an equally serious local disturbance.

It has for many years seemed strange to me that the correct popular belief in the danger of the months of March and November to those suffering from usually fatal forms of disease should not have naturally led to the admission of the truth, that these seasons would conduce in just proportion to the development of any less extended trouble.

Rheumatism, throat-irritation, biliary difficulties, and the like, are all markedly subject to aggravation during periods of frequent, sudden, and extreme barometric changes; and, though these do not occasion the same number of deaths which result from lung and bowel diseases, they yet serve to add their testimony to the truth of the position, that this excitant of disease should be accorded its proper consideration in connection with dental pathology.

(To be continued.)

MAN AND HIS TEETH.

BY E. W. FOSTER, M.D., BOSTON, MASS.

NOTHING, perhaps, short of the circumference of many volumes would be sufficient to encompass the great subject of Man and his Teeth in their entirety. Yet, as relates to man's possession of teeth,—as implied in the title,—the remarks that follow are intended to subserve the relation of that possession. Believing that knowledge of man in his past and present existence does not lead us to the conclusion of a final loss or subversion of his teeth,—of man as an edentulous being,—but, on the contrary, as being intimately associated with his life-functions, and the endowments of man in his best estate; the teeth, instead of finally falling, rank and file, from out the march of human progress, will become more perfect and comely, as being parts of a more perfect and comely body. That is to say, admitting the possibility of a future higher mental and physical type of manhood, the teeth, as factors in the general sum, are not to be excluded.

In a recent number of the *Cosmos* appeared an article on "The Evolution of Food as Inducing the Subversion of Mastication," by Dr. A. H. Thompson, of Topeka, Kansas.

The conclusions evolved from his theory were as follows:—that

through refinement and reduction in the preparation of food, in the evolution of the higher types of man, or as civilization progresses, soft, semi-fluid, and fluid pabulum will wholly predominate; and this requiring less and less the services of mastication, the latter, in such event, will become entirely subverted by the law of organic economy. Further, that there will result from such subversion of mastication a total suppression of the teeth themselves by the same law. In short, that by a certain persistent preparation of soft food on the part of man himself, aided and abetted by dietetic and synthetic chemistry, the human jaws are in some future time to become edentulous, together with a complete suppression of all the accompanying phenomena of mastication (!). This is a fair and candid statement of the article referred to, which, if true in its tenets, will, of course, fundamentally affect the race of man in that portion of his organism,—in fact, in those offices which it is apparent from *prima facie* evidence are the main support and reliance of the growth and continuance of his physical existence,—the mastication of proper food, its digestion and assimilation.

For ourselves, however, we believe in quite an opposite view of this matter, and that the coming—the higher—type of physical and mental endowment, which the distant future will probably hold in store for man, is incompatible with the loss of that very part by which the whole is sustained, and through which, to a very great degree, is to be wrought out the summation of a perfect type,—a relative meaning of which is, that there is to be a more perfect balance between man and the influences of his environment, and this largely, of course, by means of his food, which must, as all physiologists agree, be that of variety and adaptation.

Thus much by way of introduction. Let us look a little more closely into the subject of food and its relation to the teeth; let us see if any food that is proper, that is dictated by an advanced wisdom and taste, can in any way subvert or destroy the teeth that have hitherto been so instrumental in man's physical progress. Man's progression is marked by a greater variety, and, therefore, a more complex treatment of foods. Let us see, then, if this improvement in variety and preparation is a wolf in sheep's clothing, and will eventually, by slow degrees, by insidious advances, utterly destroy that which is now elemental or fundamental in man's nature. Let us also inquire if mastication is the only use affecting the teeth, and if non-use implies loss or subversion,—otherwise than we see daily happening, but in an entirely local and accidental sense,—an edentulous condition that Nature repeatedly refuses to entail on the successive races of men.

Food bears primarily two relations to the teeth, nutritive and mechanical. The former is interested in their growth and maintenance; the latter is retroactive, and relates to their proper use and exercise,

as promotive of the balance in the supply and demand of their nutritional forces. Food has, from the earliest record of its use, been necessary to man, but presented to him in forms requiring more or less mastication, from the troglodyte of ancient Upper Nile or Middle Asia, to the savory and complex dish of the modern epicure at Parker's or Delmonico's. Being a citizen of the world, man is not by descent wholly carnivorous; for the types of his teeth having the bicuspid, or premolars, and the third molars extra from some of the carnivorous species, foreshadows his complexity and his omnivorous possibilities. Indeed, if man may not be strictly called omnivorous, he is indeed multivorous, and his teeth in their various lines and facets hint back to the types of all the lower vertebrates. In the varied conditions in which man has found himself, food was not always to be had in the shape most desirable; but his dental armature embracing all varieties, which include prehension, cutting, tearing, holding, or grinding of food, was sufficient to serve his single wants; and of course, where his difficulties were constant, his opposition was strengthened by a corresponding increase of force by development; thus the massive malar, zygoma, and lower jaw of the savage chief, and his powerful muscles of mastication, are but the answers to the urgent wants of his condition.

The flexibility of the human organism is the second wonder of man; the first being his creation. That man can endure what at first seems impossible, look at the trials of the heroic Dr. Kane and other Arctic explorers, and of soldiers also. That the teeth may receive the abuse of constant and severe use, look at the hard and heavy teeth and jaws of ancient savage skulls, and of the to-day's "ancient" tobacco-chewer. A fair quantity of labor for the teeth is, of course, most desirable; yet their possibilities, partaking of the possibilities of the body as a whole, are of a long gamut, ranging from the heavy, yellow tooth of the troglodyte to the elegant, refined in shape and texture, and translucent tooth of the modern belle, whose heaviest force in mastication is expended perchance on a caramel or bon bon, or in snipping a thread now and then, or biting the end of her fan in some of the more critical moments of a desperate flirtation, or fit of jealousy, for that matter. These are merely extreme cases of use, yet both have the same number of teeth, and, for all that we know, may be equally sound. The short, deep-implanted teeth of the cave-man providentially served him in his dependent condition; and as the material body of man is to serve the man *ego*, if possible, adaptability to surroundings is a law of its existence. The fine, shapely, pearly, beautiful teeth of the belle are serving in the highest manner an æsthetic use. The surroundings of wealth and its appliances do not compel her, as their lack did her ancient brother of the cave, to masticate so much and such resisting

food; for fruits of all kinds, cakes, tit-bits, and a tender bit of steak, nicely broiled, are good enough for her (!), and these actually maintain her as the cynosure of all observers. As dentists, and therefore experts, we must all admit her teeth to be the handsomest of all, and that they are maintained and supported, not by any particular reactionary help from mastication, but by the comparative perfection of nutrition. They are, indeed, so little used in mastication, that the delicate serrated borders on the cutting edges of the incisors are still prominent, and stand in almost virgin beauty, while the teeth are enfolded by the soft folds of a clear, pink gum. Do you say that the one is more liable to drop out from a comparatively lesser use in the heavier work of mastication than the other is to wear out and encounter other injuries from the force of severer attrition? The teeth serve other purposes than simply of eating. These other uses lie in the line of vocal, oral, and æsthetic requirements. Of the belle, to some, the teeth are the chiefest facial attraction. Our great vocal artists,—to what extent do they not prize their teeth, and what utter ruin would be theirs without them! To the orator, the skillful teacher, reader, or the elocutionist,—what value can be placed upon the teeth commensurate with their loss?

No, the human teeth are not alone intended to serve in the mastication of food, as the article before referred to seems to imply by its conclusions. The other uses of the teeth, which are here hinted at, have served man thus far in the important relations of vocal, oral, and æsthetic expression, as well as they have in the purely mechanical act of mastication. The proper and higher development of the race of man cannot afford to part with any one of the means of its expression. For, as man advances and his development in these vocal, oratorical, and æsthetic triumphs advances, more and more will the teeth be appreciated, and not, as formerly, and even in some respects now, held to be useful only in the purely mechanical and material sense of mastication. The teeth were the first to stand by man in his lonely and primitive condition; they intimately prepared his food and gave him therefore his daily living, and poor as the first ancestral living was, they were reduced to the parsimony of crumbs alone that fell from the table. They were patient and long-suffering, enduring a prodigious amount of use and abuse. They were man's best helper in his early days, and, as these hard times of man's physical existence have in a great measure passed, the necessity for such extreme development has become unnecessary, and a balance has been adjusted in their behalf. So, as they have been intimate with man's hunger and the necessities of his speech, and have been partakers of his sorrow, they are not to be cut off from a share in the final coronation by any legerdemain of theory. The tongue will object to their loss, the masseters, temporals, and pterygoids will object, with the buccinators and

the superficial muscles of the face, and,—their occupation gone,—an atrophy of desolation and wretchedness will take possession of their now plump and reasonably happy condition. Yes, they shall yet assist in songs and praises and be one of the principal partakers of the banquet. Do they not deserve such recognition; and will they not receive it?

The cave-man, or troglodyte, was almost exclusively a hunter and fisher, as shown by the remains of animals and fishes found in his caves; he knew also the use of fire, and with it cooked his rude food, as shown by the charred remains of his long, long-deserted fireside. There were no vegetables as yet for him, for the miocene vegetation, of which we find some fruit-bearing trees, had disappeared, leaving the river and chase the main support of a precarious existence. He was taught by the same fundamental instinct that is found in modern man, that to keep the cold out of his body, beside the skins of animals which he used for clothing, heat-producing foods were necessary, and we therefore find in these ancestral caves that the long bones of animals were all cracked lengthwise, that the fatty marrow might be obtained. This marrow was the chief heat-producer in the blood of ancient man, since the lean animals of the chase were not likely to be rich in fat, and fortunately nature had stored it in their bones, which the early sagacity of these first men discovered and made use of.

The next most ancient men we find are the so-called pile-dwellers; those that lived in huts built on piles in the midst of lakes. Some of these huts have been discovered, and many interesting facts unearthed relative to our pre-historic race. These, too, were hunters and fishers, but they went further than their ancestors of many thousand years before; for their remains show they had domesticated many animals common to those which we have with us even to-day, such as sheep, goats, and cattle. Their clothing was of flax, and they had a sufficient quantity of wholesome food, and in variety now, and the species man began to grow apace, and make himself known in that early world for which the mammoths of the forest and jungle would seem to be better fitted, if bulk, size, and physical strength were to have chief ascendancy on the face of the earth. This lake-man, grandchild of the troglodyte or cave-man, cultivated grain, raised corn, had porridge and oaten cakes, as shown by the remains of such cakes left in earthen pots, which served to hold and cook them. These dwellers by rivers and in the midst of lakes were agricultural and social, for they tilled the soil and lived in communities and villages. It is interesting to observe that man's food, as we have shown, long ago became that of variety and adaptation to his growing wants. We therefore hold that man will always have the power and the apparatus of mastication existing and employed under the guidance of those laws that have governed

his descent and development thus far, and which will accompany him to the end, most likely.

Man is in all respects an animal, save by the union and endowment of those two colossal traits, morals and religion. He is the capstone of that pyramid whereof the mineral kingdom is the foundation,—the sub-basic division. Rooted in this, and next above, is the vegetable kingdom; and above this, both in position and organization, we see the animal kingdom. Standing on their necks, symbolizing their subjection, but showing by nature of his physical body his connection with the animal creation below him, man, crowned with those features and possibilities that distinguish him from the subdivisions of creation, is yet subject to the animal law of digestion; and, in common with the higher types of animals, man is supplied with teeth, the better to serve this law,—a law of necessity on which his very physical existence depends. Can, therefore, digestion and its aids of prehension, mastication, insalivation, and deglutition be subverted and the man still live? The proposition seems to be brilliantly fallacious, to say the least. From his birthright, drawing from all kingdoms and types, down even to the mineral kingdom, man will, by this association or kinship and the laws of his being, ever find it necessary to maintain as perfect as possible, even by his own art, the beautiful and useful dental organs bequeathed to him in trust from a remote ancestor. Man must have variety of food, which is one of the natural causes of man's development, and this necessary variety will involve more or less the office of mastication. Though chemical science may theorize on myriads of soft foods and the like, and they may be put together by the highest cuisine, yet the stomach and taste will reject any continued monotony of soft foods in which no motion of the jaw is necessary. Very much depends on the selection of food, both as regards nations and individuals. Wholesome and proper food is the desideratum in both cases, and that science is not true science nor that art true art that would reduce all foods to the monotonous level of fluidity. Having shown by palpable and evident facts of physiology that such would not meet the varied demands of the body, which is constantly subject to the process of waste and repair, all these varieties of food-supply are essential therefore to the continued sustenance and well-being of the whole organism.

Our author says, "The proximate elements, as albumen, casein, fibrin, olein, etc., will be used as foods alone, and mastication being dispensed with and digestion simplified, the former function will be abolished, and the latter reduced." The proximate principles mentioned above are of the third class (save olein, which is of the second class), and termed protein compounds, or albuminoid compounds, and may be distinguished from the other proximate principles by the term "organic." In naming the above as foods to be alone used, what is to become of the

proximate principles of the first and second class that are so highly important to the functions of life? It is evident from physiological facts that no one proximate principle or any one class of proximate principles will meet the demands of nutrition in the human body, but food, to be correct, must have parts of all the different groups, which includes starch, a food which our author proposes to do away with.

Those foods that form the blood, that produce heat, and also the nutritive salts, are not called separately foods, but factors of foods, and, as such, are vitally necessary in the grand task set for food to perform,—that of physical growth and the support of life. Man would starve if fed on albumen alone, or fat, or gelatin. Magendie conclusively proves this with reference to such diet in the case of animals. Yet he found that dogs, when supplied with water alone, lived from six to ten days longer than if they were deprived at the same time of both liquid and solid food. Water has an almost inestimable influence on the teeth as well as upon the rest of the body. In fact, we have data to prove that children having plenty of water called “hard water”—that water holding in solution a greater proportion of the nutritive salts than the so-called “soft water”—will have good teeth almost invariably; while our modern system of water-works of lake and river water evaporated in reservoirs, and holding much organic matter in solution, and being “soft water” also, will have, as in the nature of the article supplied, sooner or later, a pernicious influence on the teeth of those compelled to use it for food and drink. The “Old Oaken Bucket” is not alone a sentimental myth, but a practical reality. And the old well-sweep of our boyhood, or the clear hard-water spring from the hillside that gave its priceless supply to the bony and dental systems of its partakers,—that water so relishing, that has inspired so much genuine poetry and reflection, is the spring—not of immortal life, but of this life, and as such is personally and intimately practical to us all. In a word, I would say “hard water” for culinary and drinking purposes, and soft water for washing and other uses. Water is Nature’s universal food. It forms a large bulk of all we eat and drink, and is a large part of all we are ourselves. Here we see the most fluid and health-giving of all soft foods, furnished by Nature herself, is not having a tendency to *subvert* the teeth because forsooth it needs no chewing, but it actually *sub-serves* their highest interests; and I will show you the best teeth where the water for family use has been best for sustaining adult organisms, and the growing wants of the young. And this water comes from old, deep, and mossy wells,—wells holding in their clear cold depths the solution of certain metallic riches of the earth; riches that man must have, and that nature here so kindly and sagaciously provides. Or, again, the springs by the wayside, into whose tiny basin a liquor fit for immortals is distilled from rocky mountain-sides,

and Nature says to man, "Drink, O mortal traveler; then pursue thy way with strong limb and purpose. Cast a smile upwards to thy ancient mother, and let the light of thy face pale before the iridescent glow of thy fair and beautiful teeth." In early childhood, milk, another fluid food of the most vital importance, actually, I may say, rears the teeth as a nurse from their soft and pulpy cradles, swinging in the tender mandibles of the child. Air and light, and happy thoughts, and rays of hope, and laughter, and good fellowship are also foods for the teeth. The organism of the man may live in happy balance with these, and thus living, the teeth, as vital dependencies of the body, are as favorably affected also; and these foods, we observe, need no mastication, nor will they ever! The teeth will repay the obligations they owe to all fluid foods, and the imponderable forces, by their beauty and strength, and a full appreciation of all the duties that are required of them.

The article before referred to, by ingenious and plausible advances, compels an answer to certain seeming facts that in practice shed quite another ray on the matter of food as related to man's development. Our author comes down "with one fell swoop": first he would subvert mastication entirely; next, he nearly or quite does away with insalivation; next, he proposes to reduce digestion; and finally, the teeth are to appear no more in the primitive dental groove. But man, he says, in spite of all these drawbacks, is to progress by development to a more perfect type. Clearly, if such be the case, and the above factors are left out, then it is no longer man that he is dealing with, but something else. We may have no anxiety for the distant future of our race if we take the best care of the present. The state of affairs marked out by the theory of subversion will never, we believe, come to pass in the history of man, from reasons which we have already set forth, and that might be multiplied. Nothing in man's genesis or his daily exodus shows that he is to be fundamentally changed in his digestive tract; but the old, the present, is ever changing, but ever the same. This is the perfection of evolution; this is its hope and fruition. Nothing lost, but all renewed and perfected, the same it may be, but freshened by the vitality of a daily re-creation. Gentle peruser of these pages and fellow-dentist, do you think that the progressive march of civilization and the development of higher types of manhood,—that is, this same man perfected,—do you think such growth and perfection can be brought about by the abolition of mastication and of the teeth, and the substitution of toothless jaws and the setting of soup-kettles in the land? No; such are not the teachings of advanced wisdom, of advanced and applied science, or of the past teachings of Nature. Our friend hails the day of doom advertised by him "for physiological and economic reasons." The first is not clear in the

premises. The second is partially so, for since the hard times of a year or two past there has been, I will admit, considerable suppression (?) of mastication, and this wholly from economic reasons.

(To be continued.)

REMARKS ON OPERATIVE DENTISTRY.

BY THEODORE F. CHUPEIN, CHARLESTON, S. C.

WE have read with great pleasure the interesting article on "Operative Dentistry," by Dr. Webb, in the February (1876) number of the DENTAL COSMOS. We have followed the doctor throughout in his explanations in the above article, and we feel we can almost see "in our mind's eye" the beautiful work he is capable of; but we desire to break a friendly lance with him in this tournament of operative dentistry, in the hope that the ventilation of the subject may prove beneficial.

Could we induce our patients to observe that scrupulous cleanliness without which it is impossible to prevent the proximate surfaces of the teeth decaying, except when artificially and permanently separated, then we might expect that the simple use of tooth-pick, waxed floss, and brush would deprive Othello of his occupation. But however faithfully our patients *promise* this cleanliness, however earnestly they seem to desire to perform this duty, the very large majority of them neglect it after a few days, or forget it, or put it off, and finally relapse into the same habits of carelessness; and then decay runs riot as well after the teeth are filled as before they were touched by a dental instrument. But if permanent separations be made, and the teeth so separated be well polished by the operator, this *scrupulous* cleanliness, so absolutely necessary for the preservation of the teeth by the manner advanced by Dr. Webb, *although desirable*, is *not* absolutely necessary for the preservation of the teeth operated on by the permanent artificial separation process advocated by Dr. Arthur. The same cause will produce the same effect; and although the fillings may be inserted with the utmost care, the whole work performed in the most masterly manner, the fillings made convex so that gold will touch gold as enamel touched enamel before there was a sign of decay, and the whole filling finished without a scratch, and burnished to dazzling brightness, the labor will be labor lost if performed as advocated by Dr. Webb, and that scrupulous cleanliness he advocates and holds as necessary be not rigidly and constantly observed. For, although the points of contact may be of gold, the gomphosis articulation will soon wear this convexity flat, and then we will have two plain flat surfaces offering much larger points of contact than in the original undecayed tooth, and hence greater liability to decay.

We do not believe that teeth decay exactly at the point of contact, but a little above it, or a little below it, or somewhere about it, so that however convex the filling, however faithful the contour, however minute the point or points of contact (which never can be made by man as minute as in the original undecayed tooth, nor yet as hard as enamel), however perfect the finish, or however brilliant the luster, food will lodge in minute particles above the points of contact, will be held there (if not removed by the faithful use of floss or pick between each tooth, as advised by the doctor) as well now that fillings are inserted as before; will putrefy there, forming acid decompositions, and will result in decay of the teeth, despite the best, most beautiful, and most perfect operations that were ever performed.

These minute particles of food, lodging where they do, can only be removed by the utmost care with the floss-silk or pick passed between each tooth after each meal; and when we stop to consider the constant nibbling that our American women keep up all day long and remember that it will take probably fifteen or twenty minutes at least to thoroughly cleanse all these spaces between the teeth, we shall see that the business of life will be the constant cleaning of the teeth with floss and pick.

Now, if the tooth decayed on its proximate surface when it was intact, and if it decayed at this point despite the ordinary care given by the patient with his or her floss, pick, and brush, what guarantee have we that it will not decay again after it is filled at these points as advised by the doctor? Is the juxtaposition of gold to gold superior to enamel next to enamel? or is the tooth rendered in a better condition after fillings of these kinds are inserted than when it was intact? Or, if the patient was not to be relied on to properly cleanse the proximate surfaces of the teeth with pick, floss, and brush before any fillings were inserted, and decay thereby ensued, what guarantee have we of greater care after fillings are inserted as advised by the doctor? What guarantee that the teeth will not decay again at the same points, or at the point of juncture of gold and tooth-substance? But when permanent separations are made, and the teeth so cut as to prevent their again approaching each other, so cut that these filed, chiseled, or ground surfaces shall be always visible, and freely washed by the fluids of the mouth, so cut that these surfaces shall be self-cleansing, so cut that the point of the tongue can be easily insinuated over them, and the simple rinsing of the mouth with water will by this one easy, rapid, and simple process cleanse perfectly all these surfaces of every particle of food, then that scrupulous attention so necessary by the other method is here avoided, and although we recommend care, cleanliness, and attention, we say that the same amount of attention is not as necessary in the one case as it is in the

other ; and with less attention in the one case the teeth are preserved, while it requires the utmost care and more attention by the other mode to secure the same object,—care which the large majority of people are not disposed to give to their teeth.

We have operated in both ways,—that advocated by Dr. Webb and that advised by Dr. Arthur, so that we cannot be accused of having a hobby ; our aim being the preservation of the teeth by that method which offered to our mind the greatest chances of success, and that proving itself as affording the greatest amount of good.

Many years ago when Dr. McQuillen proposed this manner of approach to the proximate decay of molars and bicuspid in an article in the DENTAL COSMOS, we thought it a good thing, and abandoned for a time our mode of operating,—which was by free separations of the teeth,—and we practiced it for a long time ; but we found our work not proving satisfactory, and fillings inserted thus failing in our hands in almost if not in quite every instance.

Experience then, that best of all teachers, forces us to decide in favor of the self-cleansing spaces as advised by Dr. Arthur. Experience teaches us that teeth operated on thus *can* be preserved, while we have known them to fail not only with us but with others, when operated on as advised by Dr. Webb.

We have asked nearly all of our patients if they experience annoyance or pain by the impacting of food in these spaces between the teeth during the act of mastication, and with very few exceptions they complain of none ; and it is our opinion that when there *is* annoyance or pain from the impacting of food during the act of mastication in these spaces, it is due to the fact that the teeth are not properly separated. The space is not properly shaped or the food would not wedge ; it would glide off and pass into the bolus formed by the tongue before the act of deglutition.

We must also take issue with the doctor as to the relative difficulty of filling proximate cavities in molars and bicuspid by the plan he advises and by that advised by the Arthur system. Of the two we certainly think the latter plan the more difficult, for by the aid of the matrix, as advised by him, the difficult proximate cavity is reduced to a simple crown filling, almost as simple as any ordinary crown filling in molar or bicuspid.

Again, the doctor advises as a matrix a piece of smooth-worn separating-file, and lays great stress on the necessity of leaving the fillings *convex*, so as to allow the smallest point of contact with the adjoining tooth or adjoining filling. The convexity here advised and insisted on is exceedingly difficult of accomplishment, and we cannot see how the doctor obtains this by the aid of a flat piece of smooth-worn separating-file as a matrix. Does he add more gold to the filling after the

matrix is removed to obtain this convexity, or is the rest of the tooth dressed down so as to secure this desirable end and this indispensable contour?—a job we certainly would not covet. If he says gold is added after the flat matrix is removed, we say that it is impossible to do this, for, as he has restored the contour, and as the masticating surfaces of these teeth are larger than the necks or cervical walls of his cavity, the very filling that he has constructed obliterates all view of the lower part of the filling, and whatever may be added is done by guess, not by certainty; and certainty is what we want to arrive at.

Again, in the use of matrices, as advised by him, or even those invented by Dr. Jack, there is not that general bearing of the matrix with the tooth so desirable in making the filling perfect at its cervical wall, in consequence of the great diversity in the shape of teeth, so that there will be an overlapping of the gold at this point when the gold is malleted to this wall. All of this surplus gold must be removed, particularly from this point, or the filling will be faulty in the extreme, for this is the vulnerable point of all proximal fillings. Now, how is the doctor to accomplish this with the rubber dam in position, with the lips to be pulled back, with the contour of the tooth restored, and, above all, with the very limited space between the teeth gained by pressure, wedging, etc., not more than one-sixteenth of an inch at the very extreme. We confess we are at a loss to see, except it be like the negro's answer to the traveler, the trace of whose wagon broke. Hailing a negro on the road, he said, "Can you aid me to mend my trace?" Said the negro, "Hab you a strap, boss?" "No!" "Hab you some twine?" "Oh, no!" said the gentleman, "if I had had these I could have mended it myself, without your aid; I only called to you to see if you had these things and could help me." "Hab you a knife, boss?" "Oh, yes," said the gentleman. Taking the knife, the negro went into the adjoining wood, and stripping off a long piece of the tough bark of a vine returned with it, and by its aid the trace was temporarily mended. The gentleman looked on thoughtfully as the operation proceeded, and when it was completed, said, as he thanked his sable friend, "Now, why did I not think of that as well as you?" "I dunno, boss," said the negro, with a grin, "'cept 'tis dat some people got more sense dan oder people."

We do not mind being the gentleman in this case, and having the joke and laugh passed on us, if by so doing we can learn what we did not know before or had not thought of.

But to return. We do not wish to be understood as condemning the use of the matrix. We have used it and hold it as a valuable adjunct in simplifying difficult operations. Used in the cases recommended by Dr. Jack (in the excessive proximate decays of molars and bicuspid),

where *complete contour* is not the object sought, it is to our mind very valuable, and lessens the labor amazingly.

The evidence of the case related as re-performed by the doctor, to our mind, proves nothing. For we candidly believe that the character of the teeth we as a profession have to work on nowadays is as different from those which our co-laborers operated on twenty-five and forty years ago as night is from day. We rarely now meet with those hard, dense, compact, flinty teeth of former years, which would seem to have required a diamond drill to make an impression on them. In the days of our noviciate we remember seeing some of these teeth with small black decayed spots in the crown surfaces of the molars, whose owners said they had noticed these spots fifteen or twenty years before (no larger now than then), and declined having them interfered with, saying they thought the teeth would last as long (undisturbed) as they would themselves. In all probability the teeth Dr. Evans had to treat were of this class, and no doubt required little interference on the part of the dentist. In speaking of this case the doctor says, "Never did fillings serve the purpose intended better than they. The gold was so impacted against the dentine and enamel as to keep these surrounding tissues clear and bright," etc., etc.

"While these fillings would always have remained as evidences of Dr. Evans's skill, had the gold been built out so as to make it even with the edges of the enamel, and to fully substitute for the lost tissue, so that the line that defined the original contour would have been perfectly restored and the gold in the one have come in contact with the other instead of allowing the enamel to closely approximate, these operations would have been still finer mementos.

"These fillings were removed and others inserted, simply because they had not been made fully even with the edges of the enamel, and because they were also concave; and, although quite nicely finished, for a number of years the gold has been dark, and for reasons stated could not be kept bright, notwithstanding the lady made every endeavor to do so, when daily cleansing the incisors upon which the operations had been performed."

Doctor, doctor, how could you do it? We do not wish to be, or say anything, unkind, but after making these admissions, what becomes of your own words in the former paragraph? "These operations were still further unmistakable evidence that it is not a peculiar preparation of gold, not the appliances, nor *experience*, upon which the performance of successful operations depend, but upon intelligence, ability, genius, and the motives which actuate the man." Surely, if these fillings of Dr. Evans had preserved and were preserving this lady's teeth, as you yourself admit, what more under heaven could possibly have been demanded of the operator? Was it simply because

the gold had by the long lapse of years got dark—which it seems to us could have easily been brightened with any of the appliances at your hand, and at no cost or annoyance to your patient—that the re-performance of the operation was demanded? Was it simply because the fillings were concave and not convex that the re-performance of the operation was demanded?

Surely this does not seem to us sufficient ground for interference, and instead of a tribute to the skill of Dr. Evans appears to us just the reverse; for though you do not say so in words, the inference is that “if they had been done thus or so they would have been done better; or, if done by Dr. Evans as done by Dr. Webb, they would have been done better.”

It does seem to us that the dentist of the present day has enough to do in the preservation of decayed teeth without doing over good faithful work whose defects exist more in the imagination than in the reality.

Of the remainder of this article we have nothing to say, our bone of contention being, permanent artificial separation with fillings inserted when indicated *versus* temporary separations by wedging or pressure and contour and convex fillings.

We break this friendly lance with the doctor only for the good which we hope the tilt will bring about in the sifting of this apparently inexhaustible subject of the filling of proximate cavities; only because we desire to know if we are wrong that we may be set right; or, if right, to induce those who may be pursuing a wrong course to abandon it.

REMOVAL OF INFERIOR DENTAL NERVE FOR NEURALGIA.

BY PROF. JAMES E. GARRETSON, M.D., D.D.S.

REPORTED BY DANIEL N. MCQUILLEN.

Miss S——, about 21 years of age, a young lady of much personal beauty, had suffered severely for over three months with neuralgic pains, shifting from branch to branch of the fifth nerve. During this period the most powerful opiates had not secured her an hour's sleep in any one night; even two grains of morphia or twenty grains of croton chloral had no effect whatever. Dr. Garretson, finding treatment to be of no avail, decided to operate, which was done Wednesday, February 9th, 1876, at the residence of the patient, in the presence of Prof. D. Hayes Agnew, M.D., who administered the anæsthetic, using ether and a small quantity of chloroform. When the patient was in complete narcosis, Dr. Garretson made an incision of about two inches and a half in length at the base of the left inferior maxilla; raising and pushing the facial artery from the facial notch, he cut anteriorly across a branch of the artery, which was ligated; then, dissecting down to the periosteum, removed (with trephine, small chisel, and saw) the roof of the inferior

dental canal, fully exposing it from the anterior mental nearly to the posterior dental foramen, making an opening of about two and a half inches in length and one-quarter of an inch in width. The exposed part of the inferior dental nerve, which was found to be very much softened and disintegrated, was then removed; a portion that had not been uncovered by the operation was incised, and gotten away by means of a cutting probe at its entrance at the ramus of the jaw. Alum-water was injected into the canal, washing it out thoroughly. A piece of linen was inserted into the cavity as a plug, and the opening closed by means of ligatures. There was but a very limited hemorrhage during the operation.

Dr. Garretson, who has performed operations upon this nerve a number of times, maintains that when neuralgia arises from a lesion of it, the present fashion of removing a limited portion, as practiced by the use of the ordinary trephine, affords relief only in exceptional cases, and that for the reason that the portion diseased is seldom removed through such manner of exposing it; an assertion which was fully corroborated in the condition of the nerve as found in the case reported.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR MEETING, EXTRA SESSION.

(Continued from page 201.)

TUESDAY, December 21st, 1875.

Afternoon Session.

MEETING called to order at two P.M. by Dr. Northrop.

Dr. S. B. Palmer, of Syracuse, New York, read the following paper, entitled "The Chemistry of Dental Caries:"

In treating my subject, I have in mind the almost insurmountable barriers to perfect knowledge of the growth and decay of organized bodies, as well as my imperfect ability to distinctly communicate my ideas respecting the subtle forces of Nature most active in the composition and decomposition of matter. Let this, therefore, constitute my apology for the *manner* of my address to you. The *matter*, like all processes of original thought, needs no excuse.

When thinking on this matter, there seems to open before us such a vast volume from the library of Nature, upon points shrouded in mystery, that we are fain to forego any investigation not absolutely necessary, and adopt the already-recorded facts and teachings of our authors, with hardly an effort to prove their truth or falsity. Thus, it would

be of little general benefit, should I write upon the degeneracy of the teeth, their anatomical structure, or their analysis. My best efforts in such directions would be little better than those of a transcriber.

When I turn my attention to dental caries, I read that acids are the general promotive agents of decay. Assenting to this, I read further that the particular acid in action may be determined by the nature of the decay; and my faith in chemistry prompts me to accept this statement without experiment. But when I am told that an agent will produce the same characteristic effects in the laboratory and in the oral cavity, I desire to know how this production has been accomplished; for it would seem to be in violation of the law that "*for every particular effect there is a particular cause.*"

The science of dental chemistry has dragged slowly along for the last fifteen years. Many theories have been advanced which have led to important discoveries. Yet it must be apparent to reflective minds that we lack knowledge of *first principles*, or *laws*, by which to account for so much that is mysterious to us. In reviewing the subject of dental chemistry, my observations point to the fact that all our knowledge ceases where *vitality* begins. The words "vital principle" seem to be undefined. Yet, while it may be impossible to know what life is, I am inclined to think that we often confound the *life-machinery* with the *engineer*.

No one has so well led my mind through the wilderness of tangled forces as Dr. Atkinson. I cannot do better than quote him, from a discussion on dental pathology, at Detroit, in a meeting of the American Dental Association. Speaking of the germ of cell-life, he said, "What does that mean? Until we go back to atoms, shall we ever know what that means, and understand how atoms become formed together by a satisfaction of bonds of affinity, making molecules, which, by an irregular combination, form an irregular mass called granules? and how a regular arrangement of cells produces tissues, a regular arrangement and correlation of tissues produces organs, and a regular position and arrangement of organs produces systems? We must go in and behind cells to know how they are generated. We must start with atoms."

Thus the doctor led us back to atoms, and came near to a discovery of the key which shall unlock the mysteries now enshrouding the formation of organic compounds. Believing in some occult force, he names it "bond of affinity," and by it unites atoms into molecules, generates cells, etc., retracing the steps before mentioned. It is of this "bond of affinity" that I wish to speak. When we come to comprehend it, we shall have passed the ice-bound regions, and shall find fair sailing in the long-sought "open polar sea."

Our knowledge of matter ends with the atom. We know that all

matter, organic and inorganic, is composed of atoms and controlled by unerring laws. It is by effects produced by and on matter that we become sensible of various forces in Nature, such as gravitation, cohesion, chemical affinity, magnetism, etc. Where there are a number of these forces correlated, we apply the same rule to them as to matter, tracing them back and arriving at principles. Thus, after so tracing, I shall call the (so to speak) *atom-force* electricity.

I will not offer my original opinions on the nature of electricity, remembering the words of Faraday: "There was a time when I thought I knew something about the matter; but the longer I live, and the more carefully I study the subject, the more I am convinced of my total ignorance of the nature of electricity." This avowal, from the most eminent electrician of his time, is well calculated to make us somewhat reserved in our expressions on the subject. Yet I do not quite like to think this the sum of the knowledge, relative to electricity, of all the ages. We call to mind the assertion of Arctæus, an eminent physician of the second century after Christ, "The cause of the toothache is known only to God." Still, a lack of knowledge of the nature of electricity need not hinder—and, indeed, should stimulate—investigation into its action on, or in, matter.

It is from studying chemical action and the electric currents evolved thereby, that I attempt to account for some of the peculiarities of dental caries.

Let me say, in regard to the current, that it is a manifestation of electricity presenting all the peculiarities and unfathomable mysteries of that force. This manifestation is called a *current* because it appears to be progressive from point to point, *not* because there is really any *matter* present which *flows* from one point to another. The name, however inappropriate, we will use, for we need a name for anything with which we have to deal.

Though we do not possess full knowledge of this force, there are discovered concerning it, from time to time, new facts, from which are deduced the laws of electricity. A law, once fully established as such, may be regarded as a truth which will never fail us. This fact encourages us to search for truth, and to apply what we know as such.

In spite of the discouraging mysteries presented by the complexities of electrical phenomena, we have facts to aid us in accounting for some of the peculiarities of dental caries.

But, first, we cannot enter into decomposition until we have some knowledge of the *composition* of matter.

In accordance with modern science, I believe electricity co-existent with matter; if not matter itself, it is, at least, around and in all matter. I believe it to be the "bond of affinity" which, through its polarizing influence, unites atoms, forms molecules, or builds moun-

tains. I base my conclusions on experiments with electricity as it reveals itself in its action upon molecules and atoms.

If we take a plate of glass, sprinkle upon it some fine iron filings, and bring the glass near a wire conveying a current of electricity, there will appear to be life communicated to the particles of iron. Placing the glass over the poles of a magnet, and gently tapping it, the filings will at once assume definite relations to each other, forming the beautiful "magnetic curves." By this simple illustration, aided by a few others, I hope to impart the modern notions regarding *crystallization*.

In the above experiment, each separate particle of iron becomes, by induction, a magnet, possessing opposite magnetic poles. According to the law, these opposite poles attract each other,—a positive joining to a negative, and *vice versa*; hence the production of a definite structure peculiar to the material, iron filings. Carry, now, this example to the production of solid bodies, and we shall easily understand how crystals are formed by polarization of molecules.

A piece of Iceland spar, properly cut, and introduced as a slide into the polariscope,—and also crystals of nitre,—present peculiarities not unlike the magnetic curves seen upon the plate of glass.

Other substances, however, present very different figures. For example, a slide of ice shows beautiful, flower-like figures, as described by Prof. Tyndall; also snow-flakes. The crystallization of moisture on our window-panes in frosty weather presents figures the lines of which make with each other the invariable angle of 60° . This angle is always characteristic of the solid condition of water. The shoots of sal ammoniac crystals are at angles of 90° , with branches at 45° .

Carrying our experiments to metals, we shall better understand how a mass is built up. Let us dissolve sulphate of copper in water; in the blue solution obtained we have copper divided into molecules.

When we present a light body, as a ball of pith, to the prime conductor of an electric machine, the light body is said to become electrified, or filled with electricity of the same polarity as the conductor. Now, being of the same polarities, these two bodies repel each other, and the ball will be attracted to any other body having an opposite electrical polarity to itself.

When we introduce the poles of a battery into the solution of copper which we have formed, the same actions take place regarding the molecules of copper which occurred with the ball of pith. The copper molecules are *charged*, or thrown into a state of polarity, by one pole, and attracted to the opposite battery pole, which possesses opposite polarity. The attracted molecules, when they arrive at the pole, being of the same material with each other, combine as soon as they arrive within the grasp of cohesive force, thus becoming a homogeneous mass of

copper; hence the phenomenon of electro-plating, and the philosophy of the union of atoms and the bringing together of materials to form the globe.

Next let us consider the *conditions* of matter.

We have already seen that matter unites under the supervision of electricity, and in the presence of conditions which allow free circulation of the molecules, as in a fused or fluid state. In all matter thus formed, there appears to remain electricity in a state of quiescence; at least, we cannot place two bodies in such relations as to allow interchange of polarity, without the manifestation of a current, which current will continue until equilibrium of polarity is attained. Here is the great secret of composition and decomposition.

I know there are other theories as to the presence and nature of electricity in matter. It is, by some, regarded as a sort of vibratory force, affecting the particles of matter. I speak here only of the phenomena attending the decomposition of matter. Such decomposition shows a *current*, no matter what the nature of that current may be. Its effects upon organized compounds are what now interest us.

The electrical *classification* of elements and compounds is now to be noticed.

Make a scale of the metals, commencing with platinum and ending with zinc. (This scale may be found in any text-book on electricity.) The first on the list is negative to all below it; and so, also, with any one in the list. Conversely, each is positive to those above. Certainly, changes of temperature, or of the fluids of immersion, will make some changes in the order of this list, which is based on the supposition of equality of circumstances.

In electrolysis the lower or positive elements sustain the greater loss of material; for instance, platinum or gold completely destroy zinc, without apparent loss to themselves.

A similar list of non-metals and compounds is governed by laws the same as those of the metals; also a list of fluids, beginning with nitric acid and ending with caustic potash.

As acid is above alkali in this last list, so the higher element in any electrical combination produces the acid current, and the lower the alkaline. This principle I have advocated in former articles on the relations of various fillings to the teeth.

In our progress thus far we have drawn our illustrations from acids, bases, and salts; but with these alone we could make no advancement in organic compounds.

Modern chemistry occupies its present advanced position in consequence of the knowledge of carbon and its combinations with oxygen, hydrogen, and nitrogen. Through want of knowledge of these combinations, their complexity formerly resulted in the conception of the

idea of "vital principle," which hedged the way to further investigation. Chemistry now produces in the laboratory many compounds which formerly were supposed to be organic products.

Failing to produce organic cells, yet chemistry enables us to discover the processes by which material, or nutrition, is conveyed to and from the organs of the system. The principle is not essentially different from that of the construction of crystals, already referred to,—that is, the aggregation of atoms and molecules is the result of electropolarity.

This aggregation, as shown, is simple in those cases where fluidity allows the direct movements of molecules. But in plant (and other) growths the necessary fluid state is not present to allow external deposits of molecules. Growth is, in such cases, accomplished from within, by what is termed "electro-capillary" currents, which are "forces more important than any others concerned in the functions of organic life." M. Becquerel, a French scientist, says, "In order to produce them, nothing more is required than permeable tissues separating two liquids of different natures, which find in the organism the conditions necessary for their production. Arterial blood, leaving the left auricle of the heart, before becoming venous blood traverses capillary vessels which bring it in contact with muscles covered with exuded liquids. Electro-capillary actions are thus excited, subserving their nutrition and growth."

Take for illustration of the above any plant. It draws from the soil water impregnated with alkalies; from the air, through its leaves, it absorbs carbonic acid, a substance directly opposed in nature to that entering at the roots. The result of the meeting of these opposites is electro-capillary force; composition and decomposition take place, and the plant grows from the nutrition thus received.

When we come to consider this force in connection with the assimilation of the elements used in supplying the demands of organic tissues in animal life, we are one step nearer to a perfect knowledge of the structure of a tooth, and one degree higher in our comprehension of organized matter.

While the principle of electro-capillary action is manifested in supporting animal organizations, the combination of nutritive elements, as well as the location of the absorbent vessels, is almost the opposite of plant life. Air enters the plant through wide-spread foliage, externally; but the animal receives it internally through the closely-packed lung-membrane. Carbonic acid is life to the plant, but death to the animal; oxygen is rejected by the plant and received by the animal. These oppositions, however, do not change the principle of electro-capillary action, for they are equally capable of producing polarity of the elements required to build up the structure.

This force, though often mistaken for, is not "vital force." It is but a mode of conveyance of material employed by the "Master Builder," and which works according to the type or model given in the parent germ. The assimilative organs appear to act according to this principle, intelligently selecting from the blood the exact quantity of the proper materials to complete the organism. Thus the teeth are organized and crystallized under the general law which governs the union of atoms.

We have now reached a point from which it is possible to contemplate the anatomy and analysis of the teeth. But I shall not stop to endeavor to convey information on these points. The attempt would be superfluous here; and, also, this has already been done by authors much more competent than I to teach this subject. I would say, however, that we should not blindly accept *all* such teachings, but indorse only such as will endure the tests of law and reason; for only "truth is mighty and will prevail."

I have dwelt long on the principles of tooth-construction. The act of reduction is little more than a reversal of the processes of construction. Particularly is this true in the so-called absorption of the roots of the deciduous teeth,—which may be better comprehended, according to the principles already exhibited, through solution, or conversion to the fluid state. This principle (of solution) is manifested in the changes which take place during gestation and lactation. It is well known that the teeth of the young are much softer (more readily convertible into a fluid condition) than those of adults.

With teeth, as with other crystalline bodies, the molecules last added in composition are the first to enter into solution. In other words, the original framework crystals are hardy and enduring, while the filaments are not so much so. Take a block of transparent ice in which are no indications of structure, expose it to the sun's rays on a cold day, and the crystals will be dissected by the solar heat; the portions last added as a filling between the original crystals are the first to melt, and leave the parallel framework, like a bundle of ice-rods, lengthwise of the block.

From this example we may deduce a law respecting constitutional changes in the density of teeth. The dissolving cause is simply a change in the electro-capillary current, taking from the tooth the movable molecules and delivering them where there is a deficiency, for poverty will always draw from any supply to which it has access. This view supports the theory that the diet must supply the necessary phosphates, or teeth cannot be well organized primarily, or maintain their integrity secondarily.

In cases of absorption of the roots of teeth we find the entire structure removed on that portion of the root nearest the incoming tooth.

This seems to indicate that the attraction is local, and the growing tooth is in a "local circuit" with the deciduous tooth. For example, by bringing a heated body close to the block of ice, that part nearest the heat would be melted without exhibiting crystalline structure.

In considering dental caries, we have only to apply the principles already considered.

The agents active in decomposing the mineral composition of teeth are chemical opposites, and generally conceded to be acids. The manner in which acids find their way to the teeth has been so often and well explained that I need not further notice this branch of our subject. I would, however, give more prominence to the acids derived from decomposition of the saliva and less to the direct action of citric or acetic acid. Let us see how these agents operate to produce caries.

We have several varieties of caries, all fully described in the books. We will take for example the extremes,—the *white* and *black* varieties. The first is by far the most destructive. It has a tendency toward the pulp, is attended with great sensibility, and is difficult to arrest. The second shows less sensibility, is slower in action, less penetrating, and is easily arrested. Not to go over ground already occupied by others, I will simply say that the white decay indicates nitric acid action, and the black variety shows the presence of sulphuric acid.

But it is seen that both varieties may and do occur simultaneously in the same mouth. To account for this, let us consult the voltaic battery.

In the battery we find chemical action of long or short duration according to certain definite conditions and circumstances. Polarization of the plates is one cause of cessation of energy; the formation of an insoluble compound protecting the positive or generating plate is another. Where sulphate of copper is used, the action is to decompose the sulphate of copper and form sulphate of zinc, thus eventually stopping battery action. The principle is the same in a two-fluid battery, except that in this the causes of stoppage operate much more slowly. Examine now the analogy between the batteries and the varieties of decay.

The black variety seems, so to speak, of the "single-fluid" species; for the salts formed by decomposition of the mineral portions of the tooth are insoluble, and become polarized in a negative position to the decomposing agent. At once the sign is exhibited in fossilized characters, "acid manufactory closed," decay ceases, and the cavity becomes filled with calcareous deposits.

Although not generally so, the opposite, or white variety of decay, may occur in the same mouth. When it does, we attribute it to difference of tooth-structure. In porous teeth, decay appears to be conducted on the "two-fluid" principle. The acid forms salts with the substance

of the tooth, which salts are at once decomposed by agents found in the saliva, and thus the same polarity is maintained, and decay continues so long as the conditions which induced it remain the same. To change these conditions is the task of the operative dentist. This may be done by filling. I have, in other articles, given my views on this subject, and therefore will not repeat them. I am bound to say, however, that the manner in which the end named is attained is still a subject of controversy between our representative operators. The use of gold is a purely mechanical remedy. Some are recorded as holding that this is true of all filling materials. Be that as it may, it does not abrogate the facts that decay is arrested by preventing access of the corroding agent to the part, and that this end may be attained by filling.

But it may also be done by rendering the tooth-structure indestructible, through oxidation of the material used for the plug. In order to make this point clear to all, let me offer some simple illustrations.

If we were to paint with gutta-percha a post to be set in the ground in such a thorough manner as to totally prevent the access of moisture to the wood, the post would remain sound as far as outside causes of decay are concerned. This preservation would be purely mechanical; and gold does the same thing in the same way for the surface of the tooth which it covers. But, if we were to take another post, steep it in sulphate of copper, and place it in the ground, it would also remain sound. In this case the preservation would be chemical.

Take two similar pieces of wood, drive gold nails close together into one and copper nails in the same way into the other, and submit them to the decomposing action of moist earth. The gold, evidently, would impart no preserving property to the wood; its saving action would be purely mechanical. But from the copper nails would be formed oxide of copper, which would unite with the wood-particles and chemically preserve them. It is on this principle that nitrate of silver acts when it turns the tooth to a dark color and checks caries.

What are the difficulties attending the production in the laboratory of the peculiarities of decay in the mouth? A concise and, as I found, a true answer is, "failure to secure like conditions." In a normal situation, teeth are surrounded by a fluid in equilibrium with them. Any disturbance of that equilibrium—as by the introduction of acids—excites an increased flow of saliva, which restores the prior conditions. But in cavities, and between teeth pressed closely together, in fissures or fractures of the enamel,—in fact, wherever there is no *circulation* of saliva or mucus,—a close test will reveal the presence of acid; and, from what has been above stated, we may prognosticate the result, the direction of decay being determined by the crystalline structure of the tooth, which points toward the pulp.

Take a block of ice, cut it into irregular angles and make cavities in

it, and then place it in warm water, and the prominent angles will be first dissolved, the depressed surfaces and cavities (by cooling and arresting the circulation of the water in contact with them) will be less affected, and the whole tendency of the melting process is to bring the mass to a globular form; for it is impossible to produce cavities in transparent ice without directing a current (sufficient to cause circulation by displacement) upon some point.

I have repeatedly tried to produce, out of the mouth, the phenomena which occur in it; but, instead of the cavities becoming deeper, the prominent portions were the first to be acted upon. However, being determined to fulfill the law and produce the desired effect, I ground and polished opposite surfaces of a tooth, and suspended it in saliva by a clamp, which also compressed against it the poles of a battery. In about an hour the magnifier showed decomposition. In twelve hours the saliva had been converted into a powerful acid, and had made great havoc with the enamel, but without any apparent tendency toward the pulp-channel.

I next prepared a solution of soda, with an excess of soda in the bottom of the vessel to maintain alkalinity. This gave, at first, flattering promise; but, on longer trial, I found that the electrodes or points of the clamp (which were of copper) had become oxidized, the molecules of copper had penetrated the dentine (shown by the color) and rendered it negative or in a state of equilibrium with the current, and no further action had taken place, or could take place, in the dentine. Salts, however, were formed around one of the poles, by union of the acid current and the alkali in solution.

Still I persevered, and, on using gold electrodes in the same solution, obtained the characteristics of decay which are found in the mouth.

In these experiments I could not fail to see the analogy between decomposing dentine and dissolving ice; for, when we place a tooth in acid, we look in vain for action in cavities. There the action of the acid is abated by its combination with the mineral constituents of the tooth-structure, and there is no current of circulation by which to displace the exhausted agent and allow fresh to take its place.

Time forbids a detailed application of the principles here set forth to the subject of resistance by vital force to decay. To summarize, such resistance is accounted for by the laws of electro-capillary action. According to these laws, as long as the constituents of a tooth are held in a positive condition to a negative agent, so long will it be impossible for electro-capillary action to bring material with which to barricade against the approaches of the enemy; for the capillary current is set in the wrong direction, and will continue to retreat, with all the movable crystals it can carry, as decay advances. But, once change polarity of the electro-capillary current by excluding corrosive action from

without, and the internal forces will at once set to work to repair the breach. Hence the preservation of exposed pulps by osseous deposits.

This contest in nature is by no means confined to dental caries. Composition and decomposition, growth and decay, life and death, are all manifestations of a law as broad as the universe, as old as creation.

If we wish to consult the tables of Nature's laws, we shall find them, not in the attic of theories or speculation, but in the foundation of fact and truth, where they were put in the morning of creation. This course, and this *only*, will give us united and correct views on the subject of dental caries.

Discussion.

Dr. G. S. Allan. I would like to know what Dr. Palmer means by electro-capillary action; I don't understand it.

Dr. Palmer. The best illustration I can give is that of a plant in which the sap conveys the alkaline elements upwards, they meeting the carbon, when decomposition takes place. It is the agent which conveys the materials, takes them from the blood, and carries them out or places them in the organ. The assimilative organs work through capillary action. In order to an understanding of this, we must intimately understand the subject of the reversing the polarity of the electric current. It is remarkable how perfectly some materials are on the balance. The slightest disturbance reverses the current. To give you an illustration how delicately polarity is balanced: in two instances the Atlantic cable has conveyed its messages from a battery formed by a single percussion-cap; which miniature battery changed the polarity and recorded the message on the other side. In life it is the same. A simple change of the current from positive to negative causes frequently a derangement of the whole constitution. In congestion there is this turning of the capillary action.

Dr. G. S. Allan. Dr. Palmer uses the wrong word. *Electro* is an adverb, and he applies it in the place of the term *electrical* capillary action. We all know what that is: that attraction which draws any fluid up a capillary tube. Now, the force that Dr. Palmer refers to is a chemical vital action, and has nothing to do with the electrical action at all.

Dr. Palmer. That is a difference of opinion merely. The electro-capillary action is a very deep study, and I don't expect to have it ventilated much here. It does not annoy me that you do not comprehend it; the time is coming when you will.

Dr. Buckingham. Will Dr. Allan explain to us what he means by "chemical vital action"?

Dr. G. S. Allan. I am afraid you have given me a conundrum. I used it only in a common way to signify vital action,—chemical action taking place under vital influences. The objection I found to

Dr. Palmer's use of the term "electro-capillary" was that it implied capillary action as taking place in the animal or vegetable structure as the result primarily of electricity; that the substance was drawn up into the capillary tube by electricity. As it is a new term, I asked for an explanation.

Dr. Palmer. Dr. Allan will oblige me very much if he will furnish me with some term which more exactly characterizes this action.

Dr. Atkinson. Before making any further remarks, I want to thank Dr. Palmer for the paper he has presented to us and to congratulate this body on its growth. We are really beginning to be somewhat worthy of our pretensions. We are beginning to have some little apprehension of what *science* means. We are getting at the scientific apprehension of the modes of motion that have been called chemico-vital. All that cloud of mere verbiage which has so oppressed us is being dispelled. With this indorsement of the paper as a whole, I remark with Dr. Allan that its nomenclature might be improved. But, as Dr. Palmer has been interrogating Nature for himself, I am quite soft in my affections toward him, and am disposed to excuse him for incorrect terms; for I have a fellow-feeling in that direction. I know that when our understanding is illuminated we have a desire to communicate it to others.

Electricity is not now known as a subtilty. It is known only as a *mode of motion*. Formerly it was "static" electricity; and that was *motie* nonsense. Electricity, when it becomes polarized, acts with the general principle of power. Principles are generic, and form manifestations of powers or forces. This holds good, either in physics or statics; so that, while we may correct the foundation and say that it is not electrical capillary action, I would not find fault with the nomination, though I should not quite indorse it. For I cannot conceive that there is a current that runs through this mass of protoplasm similar to the hole that the wire makes in the water in the case of the Atlantic cable. Air or water are not good conductors of the electric current, but iron is; and when you inclose an iron wire in something that is not so good a conductor as itself (as air or water), you have made a hole in the water and air. To all intents and purposes iron and copper wire are perfectly pervious to the electric currents, so that all they do in laying the Atlantic cable is to make the water pervious to the current. It is remarkable that the slightest manipulation at either end is sufficient to disturb the difference between the plus and minus quantities.

I feel as though Dr. Palmer's paper is an inspiration which is going to open the door to a wider apprehension of these truths. I think that through this investigation, which he has started, we shall be at length masters of the situation; that we shall not perform operations blindly,

mechanically, but in obedience to laws and the principles which underlie them. I would say nothing to discourage the efforts of any one, and especially of our friend from Syracuse. It seems to me that he understands these subjects pretty well.

Dr. Flagg. I wish to add my testimony in as solemn and serious a manner as I am capable of. I listened to the paper attentively, and I want, when I thank Dr. Palmer, to thank also Dr. Atkinson for his paper. I want to say of Dr. Palmer's paper that I think it is the best paper on that subject that I have ever heard. It has done me good, and that satisfies him, I know. I have been trying earnestly for many years to get at this very thing, but the inspiration has not been vouchsafed me. It seems to have been vouchsafed to my friend. I believe this theory, as it is called, is going to change the whole practice of operative dentistry; and that such a thing should have occurred at this time, in these days of settled practice, is an overwhelming thought. You may speak of chins and noses coming together in olden time; but, gentlemen, if it were not for the improvement that has been made in our mechanical dentistry, we should be a nation of approximate noses and chins, and this would occur at thirty years of age, instead of seventy. Look around among your patients, and consider with what difficulty we struggle against these forces which tend to undermine our work. It is not that we are trying to save worse teeth than the dentists did in former years, or that we are getting more ambitious in our operations, but the teeth themselves come to us worse. We are combating circumstances, and I tell you, gentlemen, we are not doing it nobly. I am ashamed of our profession when I see the spirit which exists of putting the bad results of an operation upon some other practitioner. I am ashamed to see so much shaking of the head and of hearing so often the remark, "I did not do that operation." I looked, the other day, one of the finest operators in this world full in the face. I had a specimen of the work of his own hands which had miserably failed and which he repudiated. I shook it in his face, and proved to him that it was the work of his own hands. I can tell you, gentlemen, that man was mortified at this exposure. It was a piece of work into which he had put his best efforts, and it totally failed in eighteen months. I have a little box in which there are little bottles containing the remains of some of the most beautiful specimens of operative dentistry, executed by some of the finest operators in this country or in Europe. These were put in to be as monuments of gold, but proved to be only monuments of brass. They were mere trash. These are cases where the work of well-known, recognized men failed in two years, and where they refilled, and made failures again. I have numerous specimens of such failures in gold fillings, taken not from soft, structureless teeth, but from cavities where proper treatment would have secured lasting

results,—on the buccal faces of the lower molars. They gave evidence of deterioration in what the operators called the “vulnerable spot.”

Gentlemen, the vulnerable spot was in the operators, but they ignominiously shifted the responsibility to some other man's shoulders, or ascribed it to the miserable structure of the teeth. I have observed cases of such failures with gold fillings which have been succeeded by gutta-percha fillings, and I have seen numerous cases where gold failed miserably, where the gutta-percha fillings now stand invulnerable. Talk about gutta-percha fillings being *good temporary fillings*! Gentlemen, if you wished to get into a window twenty feet from the ground, and had a ladder of mahogany ten feet long, and one of soft pine twenty feet long, which would you choose for the purpose? Would you not certainly take the pine ladder? But don't call the gutta-percha a ladder of soft pine; it is more than that; it is *the thing we require in these cases*. Gentlemen, I have been preparing for this fight. I had no idea I was going into battle under such leadership, but I am proud to follow my general in this cause.

Dr. Buckingham. I desire to thank Dr. Palmer for the valuable results of his investigations, which he has so fully and completely laid before us. But I can't agree with him in all he has said. Honest expression of opinion, I think, should always prevail, and we should hear with the same respect the opinions of those who oppose us as those who favor our theories.

I take issue with Dr. Palmer on the proposition he makes (if I understand his paper aright), that all changes in matter are associated with or identical with electricity. Electricity is not the only force in nature which causes matter to combine, or which controls the action of matter. That electricity nearly always operates upon matter in a way to change it, I am satisfied; but that it is the force which brings atoms together and causes them to form compounds, I am not so certain. That it is a force which causes plasticity and causes atoms to arrange themselves into crystals, I am also satisfied; but that one atom of water in a molecule is toward the north, and another toward the south, I don't believe. I don't know of any combination which takes place in animal or vegetable substances where this law of electricity holds good in all cases, nor of any chemical disposition of substances through this law of electricity. That electricity may be generated during such processes I admit.

We are all running after our leaders in this age. In our enthusiasm in regard to a particular force, we come to regard it as the *only* force. The old alchemists used to hold that there was but one kind of matter, but many kinds of forces; and that just, right application or manipulation of those forces would produce gold. We have gone to the other extreme. But forces are various; and if you have a given force it is

as permanent and continuous as matter itself. Take an atom of oxygen; it always holds certain affinities. It never loses its influence until it enters into combination, and then you have its identity as much as in an individual form. To illustrate: take the letter A. Examine it in its peculiar character; describe its shape, and show its power in the alphabet. Now put with it the letter B, and you have *ab*,—a word which means more than A or B singly. Transpose the letters and you have *ba*, another word. So we have in matter unchangeable laws impressed upon it by an Infinite Being. I don't think electricity will account for all capillary attraction. Sap may be drawn up one hundred feet,—carried up the entire height of a tree,—but I don't think it is attracted by electricity. It is not electricity that sends the blood through the veins. It is not electricity that causes the little cells to reproduce themselves. Here is one of the most wonderful operations in nature,—what we call “living forces.” You can get crystals built up by certain laws which are always definite, but by no chemical process can you make a living tissue recreate itself,—make these cells, this germ,—and reproduce this germ over and over again. There is some force which governs and controls these subtle processes, but it is not electricity. Huxley says that all protoplasm is life; that the protoplasm of a thistle and that of a man are one and the same thing. How is it, then, that one develops into a man and the other into a thistle? If you examine it microscopically, it presents the same chemical appearance, as having the same properties; yet one will grow up to be a man, and the other a thistle. There is some force that governs it. So also in plants. You have a thousand different plants, and the protoplasm of every one of these does not appear to differ from that of any of the rest. Yet they grow up infinitely different in form, shape, and color. And here comes in our ignorance of this law of nature when we say that atoms combine, and that the underlying principle of that combination is electricity. Dr. Atkinson speaks of electricity as being static; that it passes in a current, from one end of a wire to another, between two places widely separate. Now, whether this current passes from one end to the other, or whether the whole substance is charged and one end pushed off, we cannot tell. There are many things of this kind that we cannot explain. We know force to be an operation only by its effects upon matter. If we cannot see that one force is taken and the other is left,—if we cannot tell whether it is the whole of the force that acts, or a new force,—it is not reasonable to infer therefore that there is not a multiplicity of forces, as well as many different kinds of matter. This vital force acts similarly in the growth of animals and plants. Their tissues are built up by the same operations; by the same chemical and vital processes.

Dr. Palmer. If the paper which I read has given ground for the

remarks which have been made by Dr. Buckingham, then I wish to disabuse the minds of the association, and say that they have given a wrong interpretation to what I wrote. If I made electricity the only force, if I have not included in my idea *cohesion* and *gravitation*, then the paper does not read right. If I said that I could reproduce cells by this power of electricity, I don't wish to be so understood. I think I have defined my position distinctly; but I will say, if I did not give full expression and emphasis to the line of thought suggested by Dr. Buckingham, that I cheerfully adopt and indorse those ideas.

Dr. Atkinson. I protest earnestly and honestly against such mischief as the remarks of my beloved brother Buckingham may make. He either does not know what the terms mean, or he has simply got them transposed. I said distinctly and emphatically in his presence that *power* is *generic*; forces are *differentiations* of power. You may have many manifestations of it; and I introduced as instances psychical, dynamical, and others, all manifestations of power.

Don't take his definition of protoplasm, as you love the truth. The term *protoplasm* he has used in ever so many ambiguous senses. He has used it as meaning a germ. He has said that you can take the protoplasm of different substances and by examination find them similar, but that you can't operate upon it and improvise something out of it.

If you use this term in several senses, you must say "protoplasm A, B, C," and show where you are. There is the same thing in all chaotification; all food has to be brought back to a homogeneous heterogeneity—a jumble—to hold all the energies in it in an undifferentiated state, so that when it comes in contact with a cell capable of appropriating any portion, it should be in a degree of similarity of tension of the bonds of affinity resident in it. I would like to see any one get water out of oxygen and hydrogen without the evolution of electricity. These affinities marry with their bonds fully satisfied, or not at all. Even atoms themselves *think*. They think, for they know when they have got enough.

This mass called protoplasm Dr. Buckingham said might be developed into a plant, or a serpent, or a man. Don't call it protoplasm. Call it *germ*. And what is a germ? It is a confluence of two constituent elements, and those two are not protoplasm, except in an accommodated sense. The best naturalists cannot differentiate between the germ of a dog and the germ of a human being, for the reason that the only difference is in endowment of the power that is expressed in atoms,—a difference in *appetency*. Of course this power which is impressed upon matter is not tangible or appreciable.

I would like to say a word in continuation of my paper read this morning.

The habit of looking at processes, either healthy or unhealthy, in

mass, and not in the minutiae of origin, progress, and end, has stood in the way of clear diagnosis during those stages of the process which are most within our means of control.

Extirpate the necrotic point and the process is ended,—be that point the insignificant compass of a few cells, or the entire territory of tissues, fed by a single arterial branch, the lumen of which is obstructed, or whose vaso-motor nerve is paralyzed. Obstruction of neural and vascular currents precedes all necrosis of formed tissues; therefore, return of these currents before disintegrative change takes place prevents the completion of the necrotic process.

Simple mechanical pressure is sufficient for the arrest of necrosis in all cases where it is applied in time; for it favors the necrobiotic changes in the elements of tissues, the stoppage of which is the inception of necrosis or death of the pabulum, upon which these elements feed.

There is always a line of capillary and neural obstruction around every example of necrosis. The necrotic process, like all others, is progressive,—that is, there is a time when simple death of pabulum is exhibited before chemical solutions of tissue-elements occur. This point of death of pabulum is the point to extirpate if we wish to avoid extensive destruction of the congested territory by simple extension of such change in the extravasated pabulum.

In all cases, so soon as there are pockets filled with disintegrated pabulum (abscesses), evacuate them, and freely incise the margins, being sure to invade healthy vascular territories so as to secure flow of fresh blood, pabulum, and corpuscles into the sick territory.

A large range of cases have confirmed me in these views. There is one—that of Faneuil D. Weisse, of this city—that occurs to me now. It was arrested in its progress by opening the sac and incising the margins all around the necrosed bones of the superior maxilla, preventing horrible disfigurement which appeared to threaten at the time of cutting.

Dr. F. Abbott, of New York. I don't want to be personal in my remarks, but I would like to square up a matter to which Dr. Atkinson has referred. He speaks of the case of Faneuil D. Weisse. I knew of that case; in fact, had it in my professional care some time after he saw it. This case illustrates the point which I wish to make,—which is, that in cases of inflammation or infiltration without a disturbance of nutrition resulting in an abscess, if you will cut deep and strike a local point of the inflammation mechanically, you will relieve the case. There is no doubt about that. The doctor is correct; but I want to advise you not to put in such an opening a pellet of cotton saturated with iodine or creasote; it will stop up the discharge of the vitiated matter there, and you will have trouble. That was what took place in

Faneuil D. Weisse's mouth. There was an incision made in the abscess, and in that incision was put creasote and iodine, which occasioned coagulation so readily that it stopped up all the flow of these disturbing elements, and the whole maxillary process from one bicuspid to the other in front was lost. I took it away myself. In his case the cause of the trouble was originally local. It was supposed that it was a molar tooth on the left side of the mouth. After an inspection I found it was a lateral incisor on the right side, into the pulp of which a drill had been driven for the purpose of making a retaining point for the filling. There was a filling there which I removed, and there was also a dead tooth to testify to the whole thing, having the opening which caused the difficulty. This is simply explaining the condition of things as I found them. Every tooth, from the canine on the left side to and taking in the canine on the right side and the first bicuspid,—every single tooth is dead in that mouth.

Dr. Atkinson. We are all easily misled by an account. The point where the dressing was put in was in the center of the abscess. That was bagging down, and the application was made for the purpose of draining it. If anybody can show it was not wisely done, I would be glad to have them do so. I made six or seven cuts on the margin, to limit the progress of the disease. Dr. Abbott says the front was lost. That is news to me. I mentioned the case because I wanted to illustrate my point. There was satisfactory testimony to my mind that the way to arrest the diseased condition was to go to the bottom. Counsel was called in this case, and the patient was taken out of my hands just at the point when the collapse had taken place, but the last thing I did was to leave the pellet. Whether it was saturated with pure creasote, or iodine, or both those substances, I can't tell. The practice of putting in cotton I think is well grounded. It would cause only a little killing of the tissue; it would keep it from healing; and, in a day or two, it would discharge itself, and the abscess would heal up without any distention of the parts.

Dr. Flagg. I have always been in utter amazement at this stopping-place of my friend, Dr. Atkinson. The treatment of inflammation which he advocates has opposed to it the encouragement and stimulation of inflammatory action. Medical men of the present day make a more definite and marked distinction between medical and dental practice; and I thank him for that, as I would for any similar entering-wedge tending to divide the two professions. Gentlemen, my treatment, according to my best judgment, would be different. I would make it soothing to the utmost degree, and would employ mechanical interferences only for the purpose of introducing soothing remedies more thoroughly throughout the cavity. I would cut, as Dr. Atkinson did in the case of Faneuil D. Weisse, but I would not put in any iodine

or creasote. I would secure the result aimed at by cauterizing the opening. I would have endeavored by antiphlogistic treatment to cure that abscess. Were it necessary, I would leave the abscess wide open, perhaps putting in a pellet of cotton in the outside cavity. Then I would make strengthening and soothing applications, for I believe that proper healing is so without one particle of inflammatory action.

(To be continued.)

ALUMNI MEETING.

ACCORDING to notice, a meeting of the graduates of the Baltimore College of Dental Surgery was held on the 6th of March last, in the College Building, Baltimore City, with the object of forming an Alumni Association.

About one hundred of the graduates assembled, quite a number coming from other States and cities. The meeting was organized by the call of Dr. S. J. Cockerille, of Washington, D. C., to the chair; Dr. F. J. S. Gorgas, of Baltimore, acting as secretary.

The balloting for officers of the association resulted as follows:

President.—Dr. S. J. Cockerille, of Class of '53.

First Vice-President.—Dr. T. A. La Far, of Class of '60.

Second Vice-President.—Dr. S. D. French, of Class of '54.

Recording Secretary.—Dr. T. H. Davy, of Class of '74.

Corresponding Secretary.—Dr. Wm. B. Wise, of Class of '74.

Treasurer.—Dr. Wm. H. Hoopes, of Class of '56.

Executive Committee.—Drs. F. J. S. Gorgas, of Class of '55; Jas. H. Harris, of Class of '60; W. H. Hoopes, of Class of '56.

Dr. Cockerille, on assuming the chair, made some interesting remarks on the present strength and dignity of the profession, the necessity for organization, and the claims of their Alma Mater upon those she sends forth to practice the dental art. A constitution and by-laws were adopted, in which it was determined to hold the annual meetings on the commencement days of the Baltimore College of Dental Surgery.

T. H. DAVY, D.D.S.,

Rec. Secretary.

ILLINOIS STATE DENTAL SOCIETY.

THE twelfth annual meeting of the Illinois State Dental Society will convene at Galesburg, on Tuesday, the 9th of May, 1876. A large attendance and profitable discussions are anticipated.

All reputable dentists are invited.

CHARLES R. E. KOCH, *Secretary.*

KANSAS STATE DENTAL ASSOCIATION.

THE annual meeting of the Kansas State Dental Association will be held at Atchison, Kansas, commencing on Tuesday, May 2d, 1876.

J. D. PATTERSON,
Secretary.

GEORGIA STATE DENTAL SOCIETY.

THE eighth annual meeting of the Georgia State Dental Society will commence on Tuesday, May 9th, 1876, at Atlanta, Georgia.

L. D. CARPENTER,
Cor. Secretary.

CONNECTICUT VALLEY DENTAL SOCIETY.

THE next meeting of the Connecticut Valley Dental Society will be held at Hartford, Connecticut, on the 13th and 14th of June, 1876. An effort is being made to secure the attendance of some of the "leading lights" of the profession. The Executive Committee will issue a list of topics for discussion in a few days. A large convention is confidently expected, and a general invitation extended to the profession.

C. T. STOCKWELL,
Secretary.

EASTERN INDIANA DENTAL ASSOCIATION.

THE fifth semi-annual meeting of the Eastern Indiana Dental Association will be held in Connersville, on Tuesday and Wednesday, May 9th and 10th, 1876.

MILTON H. CHAPPLE,
Secretary.

EDITORIAL.

A NEW DENTAL ORGANIZATION IN ENGLAND.

WE devote considerable space in the "Periscope" of the current number of the DENTAL COSMOS to extracts from English medical and dental journals relating to a project for a new organization of dentists in England. This action has called forth very diverse criticisms from the English professional journals.

We commend to our American readers a thoughtful observation of the movement, of the discussion to which it has given rise, and of the further history of the enterprise.

Let us note in passing, that to a very considerable extent the profes-

sion is and will be estimated by its average character and attainments. It follows, therefore, that the interest of every member lies in the elevation not of himself alone, but of those with whom he is related.

The question presenting is, How can those who have educated themselves to a higher than the average standard best contribute toward the elevation of their fellows? As to the methods there may be honest differences of opinion; as to the duty there should be none.

AN EXPLANATION AND RETRACTION.

IN the department of "Hints and Queries" of the DENTAL COSMOS for February, we published a letter from Mr. Charles S. Tomes, reflecting severely upon Mr. Henry Sewill. We thought at the time that the matter would probably need revision, but assuming that, as Mr. Tomes took the responsibility of making such an attack and requested its publication, he must have felt very sure of his premises, we gave it insertion. In a private note Mr. Tomes requests us to copy the following "explanation" from the *British Journal of Dental Science*. We give it place in the editorial department, in order that it may more surely attract the attention to which it is entitled.

"Be sure you are right, *then* go ahead," is still a good motto to follow.

DEAR SIR,—It has been pointed out to me by Mr. Sewill that there are inaccuracies in the letter which I wrote to the editor of the DENTAL COSMOS, reflecting upon the course which I conceived he had taken in using for the purpose of publication matters communicated to him for another purpose, which materially affect the merits of the question. The date given in the letter (*viz.*, the summer) proves to be an error, Mr. Sewill's last letter asking for references bearing date January 19th, 1875; and, as Mr. Sewill states that the intention of publishing a book was conceived by him subsequently to his having applied to me for information, the imputation of unfair intent falls to the ground, and I regret that it was ever made. Mr. Sewill on two occasions applied to me: on the first for general information upon the subject, on the second for references to printed works; of course the information given was such as he could have obtained for himself by search elsewhere; and I by no means at any time intended to imply that he had made use of any unpublished material or researches of my own, his paper being based upon the published researches of French authors.

The misconception under which my hastily written and too strongly worded note was penned arose from my having entertained a false impression as to the date.

I am, very faithfully,
CHARLES S. TOMES.

BIBLIOGRAPHICAL.

THE STUDENT'S GUIDE TO DENTAL ANATOMY AND SURGERY. By HENRY SEWILL, M.R.C.S., etc., etc. 16mo, pp. 198. London, J. & A. Churchill, 1876.

The volume before us consists of sixteen chapters, devoted to a consideration of the anatomy, histology, and development of the teeth, growth of the jaws, dentition, malformations and irregularities of the teeth, caries and its treatment (including the preparation and filling of cavities), exposure and diseases of the pulp, dental periostitis, alveolar abscess, periostitis and necrosis of the maxillæ, dental exostosis and necrosis, absorption of roots of permanent teeth, diseases of the gums and oral mucous membrane, abrasion of and mechanical injuries to the teeth, salivary calculus, morbid growths connected with the teeth, diseases of the antrum, pivoting teeth, neuralgia and diseases of the nervous system, and extraction of teeth.

The mere statement of the size of the volume and of the topics treated is equivalent to saying that, in the nature of things, the text can be nothing more than a somewhat fuller index than the table of contents to the subjects introduced. The limits of the volume would scarcely be sufficient for a reasonably exhaustive discussion of any one of several of the topics. If the author had written under some statute of limitation we could understand his attempt at impossible condensation, but not otherwise.

The book reminds us of the remark of a satirical guest at a hotel table when the waiter, having placed before him a very small quantity of a certain dish which he had requested, desired to know if that was what he wanted. "Yes," said the guest, "that is what I mean; bring me some of it."

To instance our meaning: A single paragraph only is devoted to pathological dentition; and to this fact is probably due the naked statement, good so far as it goes, but liable, without further elaboration, to mislead, that the operation of lancing the gums "may be reasonably expected to afford relief in cases where the advancing tooth can be distinguished beneath the indurated, tense, and swollen gum," which gives countenance to the idea that the complications of dentition are caused by the pressure of the advancing tooth upon the gums, rather than by the backward pressure, as we believe, of the resisting fibrous tissue upon the developing and sensitive pulp.

The chapters upon the histology and development of the teeth and the growth of the jaws—an excellent condensation of the results of the most recent investigations—are suggestive of the necessity for a fuller treatment, not only with reference to a correct appreciation of ultimate

structure, but for an intelligent apprehension of anomalies,—the result mainly of interferences with development in the embryonic state.

The subject of caries and the value of prophylactic treatment is as well considered as the space allotted to it would allow. Similar approval, but always similarly limited, might be bestowed upon various other portions of the volume.

The leading objection to the book, viz., that its brevity compels a treatment of the topics which is too generally merely elementary, might be supplemented with positive disapproval of some of the teachings. Thus, we disapprove of the recommendation of tincture of myrrh as a mouth wash, because its dilution occasions a precipitation of the gum about the necks of the teeth, and thus tends to produce, rather than to alleviate, the spongy conditions of the gingival margins. We disapprove also of the direction, as a general rule, that tooth powders "should be composed of *strongly alkaline*, bland, and soluble substances." We object also to the statement that "the best local styptic is perchloride of iron" for hemorrhage following extraction, because of its liability to cause a slough, and consequent secondary hemorrhage. Still more objectionable do we consider the statement that "among the most useful applications in common use to diminish the sensibility of the dentine are chloride of zinc and arsenious acid." True, the author urges great caution in the use of the latter when the pulp is nearly approached by decay; but we think the caution should preclude its use, under any possible circumstances, for diminishing the sensibility of dentine, for the reason that its employment always endangers the life of the pulp. Another and the last objection which we shall make is, that Mr. Sewill gives up the fight and recommends or consents to extraction in conditions which we believe to be amenable to saving treatment.

Our final word, however, of the book, as a whole, is, "That is what we want; bring us some of it."

TRANSACTIONS OF THE OHIO STATE DENTAL SOCIETY, Tenth Annual Meeting, held in Columbus, December 1st, 2d, and 3d, 1875.

The proceedings, papers, and discussions of this society which have hitherto been published in the dental journals are here gathered into a volume which the publication committee think can be distributed more to the interest of the society and of the profession in the State. We pronounce it a very good report of what must have been a very good session. The volume is neatly got up, and contains a good deal of matter well worthy of publication.

The following extract from a recent editorial in the *Philadelphia Medical Times* may have an application to the publication of dental as well as medical transactions. The suggestion is not unworthy of consideration by County and State societies.

"The amount of money which is yearly expended upon the printing of Transactions, of very little or no value, in the United States, must be enormous. It seems to us that it would be far better if every County or State society would subscribe to some journal, to be supplied *en masse* to its members, printing nothing but the merest outline and business minutes, and turning into a useful channel the yearly sum now bestowed upon the typographer. A live weekly or bi-weekly journal would be a continual stream of light in many a place now sitting in darkness, and one year of trial would, we are convinced, render the present plan utterly obsolete. The success of the British Medical Association dates from the time when it created and furnished to its members the *British Medical Journal*. By massing numbers, it becomes possible to furnish a costly journal at a very small price per copy. Ten thousand subscriptions at two dollars make twenty thousand dollars, and would support a much more princely journal than could be furnished to three thousand subscribers at four dollars. The strength of numbers is nowhere more apparent than in journalistic enterprises, and, in spite of the enormous amount of journals published in the United States, the need of journalistic light was never greater than at present. The number of the journals published, instead of making them superior, through the stimulus of competition, renders them weaker, through the want of food. The subscription-list being small, the outlay upon the journal must be proportionate. Let us hope, then, for a consolidation of American journals, and also for the abandonment of the Transaction publication, and the adoption, by State societies, of general subscription to journals in behalf of members."

THE BODY AND ITS AILMENTS: A Handbook of Familiar Directions for Care and Medical Aid in the more usual Complaints and Injuries of Adults and Children; to which is added a Family Health Record. By George H. Napheys, A.M., M.D., etc. 12mo, pp. 438. Philadelphia, H. C. Watts & Co., 1876.

Dr. Napheys is already well known to the profession and to the general public as the author of two works intended for the instruction of non-medical readers, viz., "The Physical Life of Woman," and the "Transmission of Life." The present volume, omitting such diseases as are peculiar to the sexes, aims to condense and simplify the general principles involved in the recognition and treatment of disease, and to present them in such a manner that any person of ordinary intelligence can obtain a clear idea of the proper modes of procedure which should be adopted in the absence of a physician.

Such efforts to popularize science are commendable in so far as they convey reliable information upon anatomy, physiology, hygiene, exercise, diet, the care of the sick, and the immediate treatment to be adopted in accidents and emergencies; but they do harm in just so far as they encourage people to dispense with intelligent medical care in time of sickness.

If this volume be read with a view to such an enlightenment as will enable a layman to form an approximate estimate between intelligent

practice and quackery, it will do good. On the other hand, if it foster a love of amateur doctoring, it will be worse than useless. It is only fair to say that, with many defects both of style and matter, it is probably the best volume of its kind yet published.

PERISCOPE.

NEW DENTAL SOCIETY—On the 19th of January a considerable number of the most eminent dentists in London met for the purpose of forming a new society of those practicing dental surgery, and who are at the same time duly qualified to practice surgery. This, at least, we suppose to be the meaning of the resolution passed by them, though they seem to express it more closely, viz., that it should consist of those who are Members or Fellows of the Royal College of Surgeons. We cannot but think that this is a most praiseworthy step, though, in the first instance, it may seem invidious to many worthy dental practitioners. The formation of such a society must react powerfully on the education of dental surgeons, and cannot fail to improve and elevate the aims of dental students. In the mean time the medical course for dental students does not fall so very far short of that of the ordinary medical student, and were they encouraged to go on to the point necessary for a qualification in surgery this would most certainly tend to elevate the status of dental surgeons as a body.—*Med. Times and Gazette.*

A NEW ORGANIZATION AMONG DENTISTS.—We hear that some of the most eminent members of the dental profession have met together with the view of forming a society to which only fully-qualified surgeons shall be admissible. This society will not be antagonistic to any other existing one, the sole object of those constituting it being to improve the status of dental surgery, both with regard to professional ethics and education. Hitherto, many of the fully-qualified practitioners, who have devoted their attention to the specialty of dental surgery, have felt that they have been unjustly held responsible for much that they have disapproved on the part of those practicing dental surgery with an inferior, or even, in too many instances, without any qualification whatever.—*The Lancet.*

THE DENTAL PROFESSION.—An attempt is being made by certain dental surgeons to start a new dental society to which none but those holding recognized qualifications shall be admitted. Some of the objects of the society are "a closer association of the more highly qualified members of the profession, the formulation of an improved code of etiquette, the abolition of that advertising system which does so much to degrade the calling, and generally the elevation of the status and morale of dentists" (*sic*).

In the first place, we would remark that it is a pity when a body of gentlemen put themselves forwards as models of professional culture they do not take more care that the language which they use does not contain gross errors in grammar, since such errors may, perhaps, lead the uninformed to suspect an absence of the superiority to which they lay claim. In the next place, we do not hesitate to say that the new

society is quite uncalled for, can do no good, and, on the contrary, must injure the profession by weakening the power of the Odontological Society, which comprises all the eminent members of the profession, and which is doing all that is possible to advance dentistry. We strongly advise the promoters of this new society to abandon their scheme, and, instead of holding aloof, to work loyally and heartily in the Odontological Society, to which they and their profession already owe so much.—*Medical Press and Circular*.

THE NEW DENTAL SOCIETY.—We are informed that the arrangements connected with the formation of this society are rapidly approaching completion. A correspondent writes to us that "the response with which the movement has been met gives proof of a desire, that has long existed in the minds of some members of the profession, for an opportunity of proclaiming their confidence in the theory that the steady advancement of the specialty they practice depends, of necessity, upon its recognition and treatment as an integral part of the science and art of medicine. The admission of this principle is that which binds the members of this society together; and beyond the value that attaches to the publication of their avowed conviction in its reality, they look for results which will justify their hope that the movement upon which they are engaged will be of permanent benefit to the profession to which they belong."—*Med. Times and Gazette*.

ASSOCIATION OF LEGALLY QUALIFIED DENTAL SURGEONS.—The new dental society, concerning the formation of which we have recently written, will exist under the above title, and is founded upon the principles and for the objects contained in the following resolutions:

1. That the new society be called the Association of Legally Qualified Dental Surgeons.

2. That the chief of its objects shall be—(a) The establishment of an improved code of ethics. (b) The endeavor to encourage a higher educational standard, both general and professional, for those who may hereafter practice the special branch of dental surgery. (c) The furtherance of modes of practice compatible only with the highest professional status.

3. That in order to carry out the above objects the association shall, in its commencement, meet at least six times in the year.

4. That the business of the association shall be conducted by a chairman, vice-chairman, a treasurer, a secretary, and a committee of members.

5. That for the present it is not contemplated to publish any regular transactions of the association.

6. That all qualified medical practitioners be eligible for membership.

7. That the association shall also consist of honorary members.

The following gentlemen compose the committee and office bearers: Chairman, Samuel Cartwright, F.R.C.S.; Vice-Chairman, S. J. A. Salter, M.B. Lond., F.R.S.; Council, A. Craigie, M.R.C.S.; T. Edgewell, M.B., M.R.C.S.; D. Napier, M.R.C.S.; Treasurer, A. Coleman, F.R.C.S.; Hon. Secretary, S. Hamilton Cartwright, M.R.C.S.

The first meeting of the association will be held on Wednesday, the 22d instant, at the rooms of the Medical Society of London, where we have reason to believe it will obtain permanent accommodation.—*The Lancet*.

THE NEW DENTAL SOCIETY.—It would appear from a letter published in another column that there has been a groundless assumption on the part of some members of the dental profession that the society, the contemplated formation of which we mentioned last week, was opposed to the special degree of L.D.S. This is not so. The inferior degrees to which allusion was made were those which are so often palmed upon a credulous public by advertising men. Dental surgery has made great advances of late years, and the movement now initiated should be the subject of congratulation, having such good objects in view as a closer association of the more highly qualified members of the profession, the formulation of an improved code of etiquette, the abolition of that advertising system which does so much to degrade the calling and generally the elevation of the status and *morale* of dentists. A question of considerable importance to the Royal College of Surgeons is also brought under consideration, and one which should have before now engaged its attention. It has long been felt that the conditions of the degree of L.D.S. given by the college are not sufficiently stringent to prevent the admission of men who do not or cannot adequately appreciate the bearing of their connection with the college, or of the responsibility which that connection implies. The degree is now given without any guarantee that the recipient has undergone an educational training, and practically with the security of but a very little expenditure of time and labor. While some go so far as to insist that the L.D.S. should only be given as a pendant to the higher qualification of M.R.C.S., it will be generally conceded that at least a preliminary examination in general education should be imposed on all candidates for the dental diploma of the college in the same way as the test is exacted from medical students. The creation of the diploma has undoubtedly worked great good, and has enabled the medical profession and public to discriminate between well-trained and honorable practitioners and the swarm of dentists whose advertisements fill the pages of our newspapers; but the college should now go a step further, and make the license thorough. In its own interest it should set about propounding a scheme for the better examination of dentists, which shall provide for the removal of the evil we have pointed out. It seems monstrously behind the requirements of the age that the Royal College of Surgeons of England should license men without having first ascertained that they had been educated.—*The Lancet*.

DENTAL REFORM.— . . . Under these circumstances, we are not surprised that a few eminent members of the dental profession have united together to devise a scheme for raising their specialty to a more worthy position. Fourteen gentlemen, we believe, recently met at the house of a dentist who has proved himself an inventive surgeon of a very high order. The creative brain, however, which could devise a clever apparatus to catch a vesical calculus, was unequal to conceive a comprehensive measure of dental reform. Instead of proposing a broad scheme of medical tuition for dentists, instead of insisting on a more thorough training in general education, all that was proposed by these gentlemen was that a select society should be formed, consisting only of those dentists possessing the membership of the Royal College of Surgeons. The effect of such a policy—if it has any effect

at all—will be to alienate a large class of clever and highly-respected dentists from Lincoln's Inn Fields, and to lead them to establish or re-establish a college of dentists. We sympathize with the objects of the *élite*, but we feel that their course of action is calculated to do great harm to dentistry. The improvements which have been introduced into modern dental practice have created a trade element in this department of the profession, which has greatly increased the profits of dentists. Are the reformers going to renounce the gains of mechanical dentistry, and hand them over to the surgical-instrument maker? Such a course on the part of any one of them would indeed be worthy of a Roman dentist,—some time before the Augustan era. At all events, let us have a comprehensive scheme which will gradually elevate the whole dental profession to a level with that of other departments of surgery, not a narrow eclecticism which, though it may flatter the *amour propre* of a few, will promote jealousy and ill-feeling, probably excite ridicule and distrust, among the many.—*Medical Examiner*.

DENTISTS AND SURGEONS PRACTICING DENTISTRY.—We are glad to learn that the movement in progress for forming an association of the Members and Fellows of the College of Surgeons practicing dentistry is passing satisfactorily through the necessary ordeal of criticism. A good deal of sensitiveness has been shown in some quarters, lest the formation of such a society should be considered as offensive or injurious to the Odontological Society, or be held to imply a slight on those dentists who either hold only the license in dental surgery, or who are altogether without a title. It is not at all apparent, however, how the formation of an association of surgeons practicing dentistry, and naturally distinct by education and diploma from those who are not surgeons, should be injurious or offensive to any society or to any individuals. If it be granted that it is desirable that there should be a class of surgeons practicing dentistry, they are following only a natural and proper course in associating for the purpose of discussing interests and principles which attach to those views of the desirable status of the dental profession, understood as they understand it, and practiced as they practice it. The objects and principles of such an association must inevitably tend to the advancement and benefit of the profession of dentistry, and must in the end benefit all who claim the title and exercise the calling of dentist. The functions of the Odontological Society as a society of scientific debate are not likely to be infringed by the new association. The Council of the College of Surgeons, at the meeting on Thursday last, resolved that candidates for the dental diploma should pass a preliminary examination equivalent to that now required for the membership. This regulation is to come into force in October, 1877.—*British Medical Journal*.

THE DENTAL PROFESSION.—We are pleased to find that the Council of the College of Surgeons has resolved that candidates for the dental diploma shall, after October, 1877, be compelled to pass a preliminary examination in arts, similar to that required for the membership. The measure will be the means of bringing forward a better class of men for the special degree, while doubtless many of the applicants will decide on becoming fully qualified members of the medical profession.

The movement to form an association of surgeons practicing den-

tristry, to which we recently alluded, appears to be making satisfactory progress in spite of the hostility evinced in some quarters. The motives of the promoters of the association appear to us to be above suspicion. There is an honest intention to improve the status of those practicing the specialty of dentistry, which must in time disarm the very pronounced opposition now shown. A prime objection urged against the new association is, that it is antagonistic to the Odontological Society; but as the latter claims to be a scientific, and not a political, body, we fail to see the cogency of the arguments used by the opposition as represented in the special journals. There are many reasons against making the Odontological Society a theatre for the discussion of topics like those which it would be the object of the new association to ventilate. The classes from which its members are drawn present so many different interests and diverse sympathies that there are innumerable subjects which could not be brought under its consideration, nor, indeed, by its very constitution would it be its province to consider them. The laxity of the rules which regulate admission into the Odontological Society precludes the possibility of obtaining there a tribunal which could justly determine questions of etiquette and ethics. We consider the formation of the association a step in the right direction, and are assured that some of those who now oppose it will in time acknowledge that it is beneficial to the social and professional interests of the dental profession.—*The Lancet*.

THE FUNCTIONS OF THE ODONTOLOGICAL SOCIETY.— . . . Political progress and social position must always advance with material prosperity, and the action of the two extreme parties to which we have alluded show at once the weakness and the strength of the great body of dental surgeons in the present day. On the one hand, the holders of high-class surgical qualifications, and on the other hand, the representatives of numerical strength, must inevitably fail in their endeavors after reform so long as they remain in antagonism to each other. If each party would but have the courage to be candid, we should find that the Members and Fellows of the College of Surgeons felt the want of numerical strength, whilst the large majority of unqualified dentists aimed at the possession of some legal status. With interests so apparently opposed, yet really in unison, it is clear that unanimity can only be arrived at by mutual concessions. A profession that is but now emerging from surgery on the one side and self-estimated competency on the other, cannot afford to be divided in its councils. If the present position of dental surgery has one feature more strongly marked than another, it is that the old order of things is passing away and giving place to a new one. It would be but a thankless task to point out the shortcomings of the two movements towards dental reform that have been recently inaugurated; we would rather indicate the manner in which all sections of the profession may act together without any sacrifice, either of independence or self-respect. Maintaining, as we do, the political character of the Odontological Society, we would urge upon that body the desirability of holding a conference of the entire dental profession, and taking counsel even from those who are not officially connected with the society, as to what measures can be adopted to promote the professional and political position of dental surgeons. . . .—*Editorial in Monthly Review of Dental Surgery*.

THE NEW SOCIETY OF DENTAL SURGEONS.—We have heard it stated that the existence of such an exclusive society will induce students to qualify for the membership as well as for the dental diploma, but we are confident that if it does so in some instances it will often be to the exclusion of their fulfilling the requirements of the dental licentiate curriculum, which alone can give them the fitting education of a dental surgeon; and seeing that a large number of practical men will realize this fact, it will tend to promote a desire for the formation of a separate body of dentists, and thus undo all the good work which has been carried on for the last twenty years, tending gradually to the admission of dental surgery into the list of specialties included in the science of medicine and surgery. We would earnestly warn the promoters of this new scheme that if they draw themselves off from the general body of dentists, vainly endeavoring to make their medical friends believe that they are something vastly superior to their brother specialists, and thus force the latter into some independent organization, which we should earnestly deplore as inferior to a close union with medicine and surgery, they, the supposed *élite*, will find that, notwithstanding their pretensions, the public and the general body of medical practitioners will look upon them still simply as dentists, and hold them more than ever responsible for the shortcomings of the brethren they have sought to cast from them.

We would earnestly entreat these gentlemen, therefore, rather to combine loyally with existing dental institutions, and endeavor, as we have always done, to improve and elevate each department of it, and so gradually wipe out the stains that attach to the word *dentist*,—disguise it as much as you may by the addition of the word surgeon. Let them join the movement, which has been so well inaugurated with the sanction of world-known names, to bring about the result that the word *dentist* shall mean a gentleman with a medical qualification, in the same way that an oculist, an aurist, can only mean one who is a surgeon; when that is brought about, the words surgeon-dentist, dental surgeon, will be of the same signification as ophthalmic or aural surgeon; whereas, at present, the more sounding title is usually borne by the most thorough quack, and the one least entitled to bear it.

We have but little space or time left, otherwise we would fain point out the utter inconsistency of these gentlemen, who, while claiming a higher status than their brethren, because they possess a purely medical degree, seem to forget that as fully qualified medical practitioners all existing medical societies are open to them; indeed, the endeavor to found an independent society for the discussion of purely special subjects would serve to indicate that they lack the talent or tact to bring their specialty creditably before a medical society, or to take part with any degree of ability in those matters pertaining to general surgery which are brought under their notice.

Who has brought out the best known work on diseases of the jaws?—one of these surgeons practicing dentistry? No, a surgeon pure! Who is now arranging in our pages a series of papers on the antrum,—a cavity so intimately connected with the teeth? Who formerly contributed some papers on the connection between the teeth and disease of the eyes? Who wrote upon the effect of gout on the teeth? Who brought under the notice of the medical profession the value of the teeth in the diagnosis of syphilis? Certainly no one of these gentlemen who now seek to repudiate their brother specialists, but the sur-

geons pure who do *not* practice dentistry; and what we would infer is, —that if our ambitious friends would bring a few such matters before the medical societies, they would command attention and a greater respect for their specialty than they do now.

We would further venture to inquire how is it, if this new society is to be of such immense value to the profession, "that it is to produce a closer association of the more highly qualified members of the profession, the formulation of an improved code of etiquette, the abolition of that advertising system which does so much to degrade the calling and generally the elevation of the status and morale of dentists" (*sic*)? — how is it, we repeat, that a meeting of all those who possessed the requisite qualifications was not summoned by circular, instead of the whole thing being carried on like some secret conspiracy, to such an extent that, on inquiry, the greatest reluctance is shown to let the names of those present at this private dinner-party, which resulted in public paragraphs, be known?

Surely, if the object is, as it is stated to be, to induce young practitioners to prepare for the full membership of the College of Surgeons, the readiest way to obtain access to them would have been through the pages of the dental press; but as yet all is mystery and secrecy. With the exception of the mover and seconder of the first tentative resolution, not a man among them has had the pluck to come forward in the public prints to avow his principles or instruct his brethren in the advantages of this new society; but they are compelled to shelter themselves under anonymous signatures and quasi-editorial notices, which some of the real editors must blush to see in their pages. In truth, the whole affair is of such a nature that were it not for the unfortunate impressions which it has given rise to in the minds of many old and highly-esteemed practitioners, who hold the L.D.S. diploma alone, and in the minds of the industrious and hard-working students of the Dental Hospital, we should not have deemed it worthy of notice; but, heralded as it was with such deliberate insult to a large body of educated practitioners,—an insult which yet remains unofficially repudiated,—we have deemed it our duty to point out that, so far from tending to promote the more intimate union of our specialty with general surgery, it will, unless held in check, do more to effect a total separation of the two than anything that has yet occurred in the history of dental surgery. —*Editorial in British Journal of Dental Science.*

REAL PROGRESS.—Amid all the agitation that is now taking place in the dental profession, it is a source of unqualified pleasure to find that the subject of dental education is occupying a most prominent place. Without attracting as much public attention as some other matters, it is yet steadily advancing, and the decision of the Royal College of Surgeons that, after October 1st, 1877, the preliminary examination in arts shall be compulsory for every student taking the dental diploma of the college, is by far the most useful measure of advance and reform that has taken place during the last ten years.

Since the establishment of the *Monthly Review of Dental Surgery* we have steadily and persistently advocated the compulsory examination in arts; and it is, therefore, with very great satisfaction that we find a measure that we have so long pressed upon the consideration of the college finally adopted.

There is no question that at some future time the dental profession will be in a position to demand from the legislature the restriction of dental practice to properly qualified practitioners, but that day is certainly distant.

Still, the first step towards the attainment of such an end is the great impulse that will be given to dental education by the recent action of the College of Surgeons. When dental surgery, as a specialty, is brought up to the same educational standard as general surgery, dental surgeons will not only be able to ask, but will be in a position to demand, the like privileges and protection as their fellow-practitioners in the domain of medicine.

In the early history of a profession the educational standard must be the first step towards corporate rights. When a high degree of technical knowledge is possessed by the members of any body, legislative protection and prohibitory powers over the unqualified must follow as a matter of course. Hence it is that we consider the examination in arts being made compulsory is a far more certain step towards dental reform than the endeavor to register every one calling himself dentist, irrespective of social position or professional competency.—*Editorial in Monthly Review of Dental Surgery.*

DENTAL REFORM.—*Sir*,—I have watched, with much interest, the various expressions of opinion which have appeared in the *Journal* in regard to the above question. I have long desired to see the mechanical so far separated from the surgical department of dentistry, that those practicing the latter should not be, as many are now, literally the manufacturers of surgical instruments or appliances; and that there should be in all cases, as there are now in exceptional, surgeon-dentists and mechanical dentists. But I quite agree with those of your correspondents who have pointed out that it requires more than a mere mechanical training to prepare so delicate a portion of the human frame as the mouth for, and to adapt to it, a foreign material; and I, moreover, think it would be a source of distress to many possessed of refined and sensitive feelings were they to be informed that, for the future, they must seek aid for the supply of nature's deficiencies at the hands of persons holding no professional status. Whilst, therefore, I would maintain that it is quite as professional for the dental surgeon to prepare the mouth for and adapt it to receive an artificial denture or obturator as it is for a general surgeon—and especially an orthopædic surgeon—to see that a surgical instrument or appliance is properly constructed and adjusted, I must express the opinion that the former must greatly alter his arrangements in regard to fees charged for mechanical work if he insist upon assuming the professional status of the latter. As the matter now stands, it is the common practice to name a specified sum for a specified work, such as a set or partial set of teeth. The system is a very unjust one, though quite as often so to the dentist as it is to the patient, whose fees for mechanical work are but very moderate, if the number of visits and cost of the work be considered; but some patients give very little trouble, and are consequently charged too much; other patients give a great deal of trouble, and are charged too little; the strictly professional proceeding would be to charge for the visits, and, when the matter is completed, hand over to the patient the bill of the mechanical dentist. If dental reform is to be carried out,

and I sincerely hope such is in progress, let it be a thorough one; so that all who hereafter use the prefix of surgeon may be fully entitled to the status and the honor that name conveys.—*Alfred Coleman, in British Medical Journal.*

THE PROGRESS OF DENTISTRY.—Were we to answer the question, "What does dentistry most need?" we should say, "Men"—men devoted to its interests; men ready to sacrifice personal ease, unworthy ambition, and love of gain for its good; men to investigate; men to help its schools and advance its literature. Give it such men and its capabilities shall unfold, its usefulness and benefits shall extend, until not a department of the healing art shall be productive of greater good to the suffering millions. Let us for a few moments consider what men and education have already done for dentistry. Dental colleges were the outgrowth of a long-felt need. How shall young men be educated to meet the increasing demands for greater qualifications? was for years the important question pressing for solution at the hands of dentistry. Private preceptorship had been tried, and proved utterly incompetent to perform the work. Under the most favorable conditions this system was sending its subjects out upon the world untrained in habits of thought, often unacquainted with the simplest theories and modes of practice, without ability to weigh opinions or to break the bounds of the narrow circle trod by the teacher before them. Medical colleges were yet more incompetent. Dentistry as a specialty of medicine was completely ignored by them. Entire courses of lectures were delivered in them without the promulgation of a rational theory of the cause, effect, or treatment of a single pathological condition of the teeth. That they are parts of the human organism, complicated in structure and relations, more subject to disease than other organs, in intimate association with the centers of life, important agents in inciting disease in other parts, leading not infrequently to intense suffering and the abridgment of human life, were matters of which no cognizance was taken. Standard medical works taught and still teach theories exploded, and the application of remedies abandoned by dentists twenty years. Every day evidence was accumulating showing the unfitness, the inability of medical schools to furnish to dental students the information which should fit them for the duties of dentistry. How, then, should this work of education be accomplished? The establishment of independent schools seemed alone to offer a satisfactory answer. With a full appreciation of these facts a few self-denying, resolute men, in 1839, in the city of Baltimore, organized and set in motion a system of college instruction for dentists, with the power to confer upon graduates an appropriate degree. . . . From the little cloud in 1839, scarcely so large as a man's hand, have come benign influences, broadening and expanding, until to-day there is not a civilized nation of earth where its benefits are not seen. Then dentistry as a whole scarcely took rank among the honorable trades; to-day it is justly classed among the honorable professions. Then its practitioners were craftsmen; to-day many of them are gentlemen of culture and scientific attainments. Then it was a conglomerate and unorganized mass of men, each seeking to conceal his ignorance; to-day it is a body of generous men organized into societies for mutual improvement, and having in the United States alone eleven schools of learning empowered to confer its special

degree. Then it was scorned by the medical profession and unnoticed by the world; to-day it is treated with respect by the whole medical fraternity, and accorded its justly important position as a department of medicine by the broader-cultured and more conspicuous in all the professions. Then it was composed largely of men schooled only in secret formulæ and mysterious arts; to-day it is composed of men schooled in science and trained in the art of benefiting mankind. Then it was without resources or appliance; to-day it is possessed of large resources and is rich in the most ingenious and appropriate appliances. Then it was without literature, neither had it authority; to-day it has a respectable and rapidly-increasing literature and authorities as clear and fully pronounced as are the same in medicine. Then it was full of envyings, jealousies, and backbitings; to-day its code of ethics is as dignified and exacting, and the intercourse among its members as unselfish and genial, as the same in any other profession. These, gentlemen, are the contrasts between the times when dental colleges were first established and now; and these are the changes which have been wrought in dentistry by the spirit infused into it through their establishment. But in drawing these comparisons I would not be understood as claiming the dignity, culture, and importance of all that bears the name of dentistry that I have ascribed to the educated portion; neither exclude from almost reverential mention that galaxy of names—Harris, Flagg, Brown, Gardette, and others, who labored so unselfishly for the advancing of dentistry years before dental colleges were in existence. Do I hear some one query, "Are we not all in the same boat?" Let me reply, in the language of Jerrold, "Yes, but there is a difference in the skulls." Much remains to be done, and the work needs individual as well as associated effort; and, as with all advancing movements, young men must come to the front prepared to bear the larger burdens. As "a little leaven leaveneth the whole lump," and as the desire for improvement is so general and widespread, I think we may confidently look to the near future as a time when no man shall presume to appropriate the name of *dentist* unless it be by virtue of having passed the ordeal of its schools.—*Extract from Address to the Graduating Class of the Philadelphia Dental College, by Prof. D. D. Smith, March 25th, 1876.*

HINTS AND QUERIES.

REPLY TO INQUIRER, who asks in the the April number of DENTAL COSMOS for the best plan to harden plaster moulds in celluloid work. Tell him to try Heidsmann's dry heat apparatus, and he will certainly be satisfied, when he finds it necessary to use a *cold chisel* to get out his case; while he also will be pleased at the improvement in rapidity and ease of working the material (he can fire up as fast as possible). He will also turn out a tougher and better-tempered plate than by any other way. I have not spoiled a single case, always firing up to 380°, and sometimes 400°, taking away the fire and screwing down the clamp immediately.—S. E. H.

CHRONIC ABSCESS.—Will not some one of experience give me the proper treatment to be pursued in chronic abscess? A gentleman patient of mine has a

second superior molar so conditioned. It has a very large gold filling in it, inserted many years ago. It does not trouble him except when he attempts to bite on it. Another patient, a young lady, has the two upper central incisors in the same condition,—an abscess at the root of each. Precise directions what to do in these cases would be highly appreciated by D. W. J.

Is THERE a law in force in the State of Ohio regulating the practice of dentistry?—PROK.

Answer: There is such a law, and Section 1 reads as follows: "That it shall be unlawful for any person to practice dentistry in the State of Ohio for compensation, unless such person has received a diploma from the faculty of a dental college duly incorporated under the laws of this or any other State of the United States, or foreign country, or a certificate of qualification issued by the State Dental Society or by any local society auxiliary thereto; provided, that in all cases where any person has been continuously engaged in the practice of dentistry for a period of five years or more, such person shall be considered to have complied with the provisions of this act, and the act to which it is amendatory."—D. C.

THE PROCESS OF THE CAREER OF ALVEOLAR ABSCESS.—The following inquiry, addressed by one of our readers to Dr. Atkinson, and his reply thereto, may prove of interest to others beside the querist.—[ED. DENTAL COSMOS.

DEAR DOCTOR,—In your article on "Necrosis and Caries" (DENTAL COSMOS, February, 1876, page 76, commencing at fourth line) there is a paragraph which I cannot at all understand. The amount to which I sum it up is simply the repetition of a truism,—that is, "the circulatory apparatus must keep up a continual flow to support the circulatory apparatus." If it has an occult meaning, I am unable to fathom it.

Now, at the bottom of the same page you say, "Paralysis of the vaso-motor nerves will be followed by the enlargement of the capillaries and stoppage of currents of blood," etc. Now, what do you mean by an "enlargement?" Is it dilation? If so, does not this facilitate the movements of the column of blood? Does not paralysis of the nerves have a tendency to *contract* the capillaries, and *thus* interfere with circulation?

When sphacelus, gangrene of soft tissue—say connective tissue—presents itself, and parts are sloughed, what *is* this product or slough? Putrefaction has taken place and resolution of the tissue,—that is, disorganization. As you say, a part is, by the dissolution of the bonds of affinity, set free as gas. But it does not all become gas. There are rotting disintegrating tissues mixed with all manner of *débris*. You confine pus within the narrow limits of the term "dead blood," as I understand you. Then if you take, say the residuum left after desiccation or vaporization or evaporation of the aqueous part of the discharge from abscesses, what is it? Is not the connective and other tissue in cases of sphacelus converted into pus? or is not that term inclusive of disintegrated tissue?

Again, plasma is poured out for the building up of wounded territory. Now, if, instead of the proper vivification of tissue-cells, or the construction of tissue from the plasma, a retrogressive change takes place, and the plasma, or partially formed tissue-cells, are aborted, are they, after the necrobiotic (death of life?) changes, discharged as pus? That they are eliminated *with* pus is true, of course; but *are* they pus?

Now, sphacelus is breaking down of living tissue. But this abortion of tissue-cells and their discharge,—perhaps through a sinus,—what shall we call this? There is *ulcerative* inflammation there (you will object to the term *ulcerative inflammation*). But if you confine "pus" to "dead blood," what is this effete

matter spoken of? In fine, *what* is the process of retrograde metamorphosis in a diseased territory, as in a case of alveolar abscess? A reply will oblige B.

DEAR DOCTOR,—You ask me the process of the career of alveolar abscess. I think I can give it, but maybe not fully to meet the requirements of your demand. You seem to stumble at the condensed statement of what I said before the Odontological Society. You should have been there to put direct queries to me while under the illumination of the occasion, and then, I know, you would have been satisfied.

Thousands of alveolar abscesses exist, and get well spontaneously without ever being recognized by patient or practitioner. The ugly, persistent ones only come into the arena for treatment.

First. The tripod of life (Bichat) is innervation, circulation, and respiration,—that is, nerve-function, vessel-function, and lung-function,—all of which are potentially and actually present in the least factor of function of any tissue,—*the cell*. The function of the vaso-motor system of nerves is *par excellence* CONTRACTION, never, absolutely never, RELAXATION of capillaries.

Stasis results from distention and filling up of capillary loops to the degree of arrest of the currental flow. The difference between physiological stasis and pathological stasis of capillary currents is one of degree in time and fullness of vascular loops. The diastole and systole of the lungs in breathing are the analogue of all function of cell-tissue, organ, or system, and the gyres of all are interdependent. But the respiratory gyre is the point of propagation of all the others, so far as continuance of the whole is concerned,—that is, all the others may be interrupted for longer periods without detriment to the body, if we except only the flicker of an obscure *heart-beat*, which, once actually stopped, is fatal to all the rest, even breathing itself.

If I were to say, "No abscess can ever exist without the formation of gas by dissociation of molecular elements," your wisdom would probably revolt. But I cannot help that sort of wisdom other than by showing it up as non-wisdom and prejudice. Nevertheless, it is not every abscess that bursts its walls like a Parrot gun, with a flaw in its chamber, containing an overload of giant powder.

So soon as the gas causes the tissues to separate (*abs-cedo*, go from each other), a cavity filled with gas is produced, into which thinner fluid exudes from adjacent capillaries or bursted cells, which fluid absorbs the gas, and therefore the gas is not apparent to him who can see nothing more attenuated than a stone fence forty rods long and as high as his head. The contents of the abscess may now be absorbed, and the disrupted tissues again unite, with or without an intermediate stratum of coagulum. If all the extravasated fluid has been taken away, this is an example of most complete resolution (union by first intention). If coaptation of the lesion has a very thin stratum of coagulable lymph still left between the parts, we have the next best example of resolution, still "union by first intention." But if the contents are too much soured by the absorption of the gas to confer upon them the degree of similarity (dissimilarity?) of tension of molecular currents to favor the dialysis (dialysis?) [passage through the wall of the abscess and wall of adjacent capillaries], the process is repeated at the junction of abscess and tissue exactly as before stated, and we have, first, dissociation of atoms; second, formation of gas; third, exudation of fluid; fourth, absorption of gas, etc. And now another opportunity for absorption (resolution) is presented, and the abscess may disappear, leaving an insoluble mass of collapsed epithelial scales, caseous corpuscles, or other insoluble constituents of pabulum that may become encysted and tolerated indefinitely. Or the changes enumerated

may be so rapid as to infiltrate all the intercellular territory of the locality with coagulable lymph, so as to literally choke off all neural and vascular circulation to the involved territory; when stony hardness of the part ensues and lays the foundation of phlegmon, acute or chronic, or tumor, benign or malignant, according to constitutional and other conditions. Excessive bodily exercise to exhaustion of all local congestion at the point of stasis is the sure and best cure, by prevention of the several conditions enumerated.—W. H. A.

MESMERIC ANÆSTHESIA.—In the April number of the *Cosmos*, under "Hints and Queries," there was an article with the above caption, and having had some experience of a similar character myself some years ago, the relation of the particulars may not be uninteresting to others. A young lady, all of whose upper teeth were badly broken down and diseased, desired to have them all out, and have an upper denture inserted, but declined to have more than one out at a time. After extracting the tooth she was seized with a severe fit of vomiting, the nausea lasting about two hours before she was able to be removed. In about a week she returned and had another tooth extracted, with a repetition of the nausea and vomiting, as severe as before. Again and again she came, the same symptoms manifesting themselves each time. The fifth time she came in company with a Prof. R., and asked that he be allowed to mesmerize her. The professor, after a few gentle strokes of his hands over her face and down over her shoulders and arms, said the patient was ready. I extracted the tooth (only one), as requested. She seemed to be conscious of what was going on, and sat up and spat out the blood, yet could not speak until the professor brought her out of the mesmeric state, when she expressed herself as having felt no pain whatever. There was no nausea this time, and she left the office feeling, as she said, "all right." This was repeated *four or five* times, with equally gratifying results as to the pain and nausea. At last she came without the professor, and had one extracted, when the nausea and vomiting returned as severe as at first. After this the professor mesmerized her each time until all were extracted, no symptoms of pain or nausea presenting themselves when she was in the mesmeric state. Such are the facts, and I leave the reader to judge of them as he may choose. Dr. Cummins was present at most of the operations, and was cognizant of all.—M. PALMITER, *Lancaster, O.*

HOW TO UTILIZE CORUNDUM SCRAPS.—Desiring to make wedge-form corundum slips similar to molar-separating files, I have adopted the following plan, which may prove useful to others. Gathering up all the little pieces of broken corundum disks or points, I place them upon one side of an ingot-mould, which has been laid upon a warm stove; when the pieces are sufficiently softened I mass them together with a knife, and lay the other section of the mould upon it, and turn the screws. A thin slab of corundum is thus obtained, which I place upon a warm iron surface and divide with a knife into strips one-eighth of an inch wide (or other width to suit my purpose) and from one-half inch to one inch in length. While still warm I flatten them with the knife-blade into wedge-shapes. When cool, I reduce them into smooth, even shape by the aid of the grindstone. Then, holding one end of each piece in a delicate alcohol flame until softened, I pass the paste-polisher over it and push up the slide until the piece is held, and bend it to any desired angle.—C. C. FORD.

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, JUNE, 1876.

No. 6

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 230.)

HAVING, as I have said, reached a point at which we have found liable an irritation of the dental pulp, and having discussed, as preliminaries, the various complications which pertain to this condition, under the head of "systemic," we are next brought to the local considerations of the

Third cause of odontalgia; due to irritation of the dental pulp from almost complete or complete exposure.

Symptoms: pain; paroxysmal; remittent or intermittent, but not periodic; not always positively located; very severe during paroxysms; throbbing or "jumping;" great exacerbation from thermal, vital, or mechanical irritation; greater at times, generally during the night, or while in recumbent position; no increase of pain from pressure on tooth; sometimes increase of pain from striking tooth, due to concussion.

I have shown that pulps are usually irritated through the medium of external irritants; this is for the most part true, and indeed may be considered to be so, with the exception of the occasional irritation of "pulp nodules," and the admission that irritation from the apical portion, due to disease of surrounding parts, is not within the accepted signification of "external." But we shall find that the relative position in the classification of irritants becomes much changed as we advance toward immediate proximity to pulp structure.

Thus we have as the most usual, frequent, and decided cause of irritation,

(a) Infiltration of salt, sweet, or sour condiments. It will be noticed that in connection with cavities of only sufficient depth to produce, at most, but slight pulp irritation, this cause is regarded the least likely to give trouble.

It should also be remembered that this is a fruitful cause of trouble in cases where we have the complication of sensitive dentine.

I have endeavored to impress the fact that in these cavities it is not necessary that *size* of lesion should be regarded as a matter of any moment, for the reason that microscopic crevices were sometimes productive of sufficient response to this irritant to destroy all comfort during mastication.

It is, however, almost invariably the rule, after decay has progressed a certain distance, and the so-called sub-enamel membrane has been destroyed, together with the finer terminations of the dentinal fibrillæ, that a diminution of irritability occurs, necessitating a strong mechanical, decided thermal, or long-continued, markedly putrescent irritant, for the production of toothache.

When, however, decay has so far progressed as to permit a close approach to the pulp, then again certain relative changes in power of irritants take place, giving to the infiltration of salt, sweet, and sour condiments that first position which I have assigned it.

The location of the cavity may be so hidden as to defy detection except upon the most scrutinizing examination, and yet the infiltration of these irritants will *quickly* evoke a response.

The cavity may be so situated as to permit of the hardest mastication continuously, without the slightest inconvenience; it may be so filled with food and *débris* as to preclude the least irritation from other than the most decided hot or cold applications, and even these may produce but slight discomfort, and yet an irritating sweet or sour will almost instantly penetrate to the tender spot, and cause severe and long-continued pain.

It is true that this is also the case in all carious cavities where extensive sensitive dentine continues as the concomitant of decay, but it is recognized that happily this condition is the exception to the general rule.

(b) *Direct contact* with foreign bodies.

I have italicized the words "direct contact" here, to indicate that pressure is not indispensable to the production of pain when the pulp is exposed or is only covered by an exceedingly thin layer of dentine.

It seems that the mere presence of a foreign body is sometimes sufficient to produce response, provided that its own power for harm is increased by the existence of the irritation consequent upon an open cavity of decay.

It is the modifying circumstance that many pulps have been found

capable of *tolerating* foreign bodies, both non-irritating and, in some instances, even irritating, provided they are so introduced as to admit of the permanent exclusion of previous external irritants, that renders possible the operation of "capping" pulps.

It is, however, very important that nothing more than *direct contact* of these covering materials be permitted, for it is proven by experience that this is sufficient to cause death of the pulp, or, at least, it is undeniable that this protection is not always equal to the task of preventing this unfortunate result.

When mere contact is given as a cause for trouble, it can the more readily be appreciated that

(c) *Pressure* of foreign material would be immediately productive of more or less decided injury. This is found to be the case, and in this way the impacting of food or other material in the cavity of decay, which is referred to as a barely possible but not probable irritant in cases of deep-seated caries, is now given as a very probable cause of pain in the condition under discussion.

(d) *Thermal irritation*. Although I have intimated that a cavity containing an almost-exposed or exposed pulp may be so filled with food, etc., as to almost entirely prevent hot or cold applications from being other than easily tolerated, it is nevertheless indispensable that they should be so filled, and otherwise quite well protected by lips, cheeks, gum, or tongue, in order that this result should accrue; for in open, empty, and unprotected cavities, it is not necessary usually that more than slight deviations of temperature should exist for the induction of severe suffering.

A mouthful of moderately cold water, or moderately warm soup, or even a draft of cold air, is quite sufficient to cause pain in a majority of cases.

(e) *Mechanical irritation*. Although it is possible for patients to give themselves pain during their attempts to remove food from cavities containing sensitive dentine, it is nevertheless now, for the first time, in cavities containing exposed pulps, that they are liable to inflict those severe and long-continued paroxysms of suffering which are due to the inadvertent and forcible wounding of these organs.

When one has experienced the sensation following puncture of a pulp with a pin, tooth-pick or the like; the description is generally sufficiently vivid to base upon it a correct diagnosis of the cause of trouble, and it should also act as an additional warning against the possible infliction of similar injury as the result of imprudence in excavating.

At this point I cannot refrain from earnestly urging the exercise of due caution in the use of the dental engine for the preparation of these cavities. This beautiful piece of mechanism, in careful hands, con-

trolled by experience and a proper knowledge of the minute anatomy of the various pulp-cavities, is by far the best device ever offered for the delicate performance of these operations. It is a boon alike to patient and practitioner; it is the means by which, gently, rapidly, thoroughly, delicately, and almost painlessly, the most trying, difficult, and painful preparations can be made. It is a marvel which ranks high in the list of modern wonders, and which is deservedly one of the prides of our profession; but, used unskillfully,—abused,—it is a fearful thing; a thing which in an instant does the injury that cannot be repaired.

How grand a work it is to benefit humanity by proper use of such a gift! how shameful to abuse it!

(*f*) Medicinally. I have already referred to certain medicaments which are liable to inflict injury upon the dental pulp, while being used for the treatment of sensitive dentine. Just in proportion as we approach the pulp, so must we exercise great care and judgment in the use of these agents. In my own practice, I restrict myself within very narrow limits in this direction, and as the result of this circumspection, I have enjoyed, as year after year has given its record, the satisfaction of noting a constantly increasing proportion of success.

Were it not for this, I should most certainly have hesitated, even to refusal, when it was proposed to me to write upon these subjects; but as it is, I have felt it a combined pleasure and duty to offer such experiences as will at least afford at once to others the opportunity of trying the methods and deductions which I have only been able to reach through the long and laborious pathway of many years of careful notation, earnest inquiry, and thoughtful experiment.

In cases of so near approach to pulp as to amount, almost or completely, to exposure, I object decidedly to the use of cobalt, chromic acid, iodine, chloride of zinc, and such like devitalizers, escharotics, and irritants. I moreover object decidedly to the use of creasote, for the varied reasons that it is a medicament of very unpleasant and persistent odor and taste; exceedingly liable to produce eschar even with very careful manipulation; very objectionable both locally and systemically to many patients, and incapable of producing any results which may not be duplicated without its employment. My experience compels me to the assertion of my belief that a larger success is the reward of its abandonment.

I regard the saturating of the thin layer of dentine covering an almost-exposed pulp with a powerful devitalizing antiseptic as unphilosophic in the extreme, and I date my first markedly progressive step in the treatment of this most critical condition of an all-important organ from the time of my complete abandonment of creasote.

The oily carbolic acid is only less objectionable than creasote, because

it is not quite so powerful. I soon, in experimenting, largely and advantageously diluted both with oil of cloves.

It seems almost needless to mention arsenious acid in this connection; I think that I placed my record sufficiently strong in this matter when upon sensitive dentine; but it is so seductive an agent, its work is so quietly done, and its results are so specious, that I feel it my duty to warn again of the utter folly of its employment, no matter for how limited a period, for any other purpose than avowed devitalization of a pulp; not that it always devitalizes, for it does not, but that it devitalizes so universally that we should not have known that it was not universal, except as a most infrequent result of attempted devitalization.

These are the causes from which trouble is liable to arise prior to capping or filling.

Diagnosis of exposed pulp.

The first and most important step towards gaining proficiency in this matter is the acquirement of a thorough knowledge of the peculiarities pertaining to the various pulp-cavities.

The stereotyped information that the pulp-cavity is in shape a miniature of the crown of its tooth will be insufficient for much practical utilization, and that observation, which alone can give any assurance of success, will soon develop the fact that pulp-cavities, except in a very general way, are not shaped like their respective teeth.

Where cusps are blunt and round, pulp-cavities are found with cornuæ attenuated to a needle-like fineness; where cusps are nearly equal in length, a remarkable difference is found in the length of the cornuæ.

So much is this the case, that in the preparation of a cavity of decay, if the exterior of the tooth is taken as a guide for depth of excavation, or for the drilling of retaining-pits, ample amount of dentine will be found in some directions, and deplorable exposure of the pulp will declare itself in others. As one of the most marked instances of this, I give in diagram a superior first bicuspid.

Besides this, the position of the teeth in the jaw is never that upright one which is given in diagrams, or which is usual in manual examination; for this reason, additional attention should be given to the directions in which unexpected tapping of the pulp-cavity occurs in the mouth.

In considering cavities of decay in relation with pulp-cavities, it is necessary to regard four things:

- 1st. *Situation of cavity of decay.*
- 2d. *Depth of cavity.*
- 3d. *Direction of cavity.*
- 4th. *Character of caries.*



By the study of pulp-cavities, it will be noticed that upon the situation of the cavity of decay depends much of the danger of near approach to the pulp, and that a depth of cavity may be innocent in some places that would be imminently dangerous in others; and again, that decay may progress to great extent in some directions, without seriously injurious results, while in others, half the extent of loss of dentine would eventuate in large exposure of the pulp.

But it is probably the character of caries which is most important should be studied in this connection, for it will be noticed that as the progress of decay is slow, and the carious material firm, dense, and dark, so is exposure of the pulp not liable to occur; as decay is more rapid, and the carious material horny, flaky, softer, and usually more sensitive, so is exposure of the pulp more liable to occur, and most likely then as the result of excavating; while, as decay is most rapid, and the carious material most pulpy, softest, whitest, and frequently entirely devoid of sensation, so is exposure of the pulp most liable, and, indeed, does sometimes openly and extensively occur, presenting us with pulps largely denuded and bare of all covering, even that of food.

It requires but few words to give the probable reason for these facts; explanation points decidedly to the known ability of the pulps of such teeth as are affected by slow, dark decay, to recuperate; this, together with the length of time afforded them for doing so, is sufficient comment upon the result.

The intermediate grade of exposure is governed by a qualifying grade of influences, and the peculiar laminated character of the decay renders excavating exceedingly dangerous to the integrity of the pulp.

The cases of frequent exposure, or condition equivalent to exposure, are those in which the formative power of the pulp is lowest, the recuperative power least, the progress of decay most rapid, and the consistency of the carious material completely non-protective.

(To be continued.)

MAN AND HIS TEETH.

BY E. W. FOSTER, M.D., BOSTON, MASS.

(Concluded from page 238.)

WE do not hail any chemistry or cuisine that would destroy and disarrange that which it should strengthen and perfect. Man, as we have said, must have variety, and this variety, which is insisted upon, is one affecting the density as well as kind of food. I should not think greatly of the wisdom of the coming man that would advise or compel the entire use of soups and soft foods to the local destruction and

derangement of the teeth and stomach of the persons thus using, when he has the past to teach that those thrive the fastest whose foods have been most palatable, various, and best adapted. On the contrary, this we see by the light of the past history of our race and its evidently coming wants: that man is to be better furnished in his mortal tenement by the better use and application of that which he already has in abundance; that the teeth shall be preserved by proper exercise in the reduction of proper food for the body; that chemistry or dietetic science shall teach us all the better how to prepare the food that is allotted to us; how, also, the great waste of food-stuffs, in this country especially, may be entirely cut short or more perfectly utilized. These are a few of the problems of modern civilization; nor will the better preparation of food bring into "utter disuse" the apparatus of mastication. On the contrary, it is more reasonable to hold from what we already know of the laws of health and continuance of the same, that, with proper and more perfect food, the advance of science and art in its production and preparation, from progressive wisdom in ventilation, and other fundamental adjuncts to health and well-being of the race, the teeth, sharing the health enjoyed by the body as a whole, will arrive at that stage of perfect balance between their inherent and opposing forces. The established order of man, we have shown, depends upon certain fundamental laws. The unity of the race and the kinship of the lower orders depend upon and are governed by these laws. No organized being can escape such government any more than material substances can escape the laws of inorganic nature that govern them.

Therefore, in looking backward, we see Nature has varied little, if any, in the main. Her fundamental principles of architecture are still intact. Her laws are not to be changed. She is privileged, however, to sport in abnormalities, now and then, when one law or impulse has crossed or neutralized another. Yet, in the yearly return of the seasons, we see her face ever going and returning, ever changing, fresh and fair; drooping and melancholy in the closing days of summer and fall, or blustering and snappish in the closing days of winter and spring. Also, she permits her chiefest tenant, man, to have continual renewal and decay of his body, yet he is ever the same; modified to suit his environment in arctic, tropic, or temperate regions of the globe, by lesser or greater stature, more endurance or sensibility, as the case may be, yet is man still man, one *species*, but of several *races*, with his full complement of teeth in each, and more or less active. From the ominous quiet in the dental ranks, is it to be inferred that the conclusions of a theory touching the subversion of the teeth are tacitly consented to? If so, it is probably from a benumbing effect they have had on the prospective thought of our dental fraternity, who are now looking with

blank amazement at the bare suggestion of an edentulous human race, and the consequent loss of the now thrifty and useful profession of dentistry. And for all this, apparently without concern, one of the most ardent promoters of such a catastrophe sits chuckling to himself in Topeka! Or, perhaps, the spirit of our brethren is resting in that strain of bravado, based on present security, and giving vent to similar views of the situation that we have heard characterized the mind and tongue of the once-only inhabitant of the fast submerging earth, in his brief but pithy remarks upon the passing and inhospitable ark. But, let us take courage, for perhaps the doctor will allow us to keep mechanical dentistry for the sake of some other very useful offices in which teeth may be employed other than in mastication. Yet, this granted, I see a difficulty; for, being provided with substitutes, one must agree not to use them for mastication in order to make the subversive theory correct. No matter if a toothsome apple, peach, grape, fig, or fruit of any kind, tempts one to put his teeth into it, after the ancient and satisfactory manner of treating fruit, self-denial must be cultivated in this as in other things that relate to the phenomena of eating.

I mention fruit, for I presume the doctor does not hold as necessary to his plan of subversion that nature will suppress the luscious and healthy fruits of the earth, because they might not be used in cooking, or even if they were not touched at all. The apple and orange might be worked off by the future edentulous man by way of an orange-ice and as apple-jack, a form not entirely objectionable to the present habits of the race, I learn. O, these days of Dr. Thompson's, when the grinding will be low! no more malleting, no more toothache or teething, no more swashing the teeth, mouth, lips, and gums, with miserable creasote, acids, caustics, and patent nostrums! no more buzzing and purring around a sore tooth with engines diabolical or otherwise! no more filling with gold on an exposed nerve! not a word to be said on amalgam, in its favor, as of late, by many who would have persecuted the same remark in others a year ago. Ah! these coming elysian days, when the dental pruning-hooks shall be changed into plowshares, and the misery-making mallet shall grow hoary with cobwebs and disuse. Then will the long-used but now wasting muscles—the masseters and temporals—flap like the idle sails of the ship of the Ancient Mariner: and the cord-like pterygoids, like the ship's idle mainstays, now, alas, swing idly in every breath that blows.

To my mind, a much better theory might have been advanced with regard to the suppression of the teeth and mastication from the pernicious fact of the daily and ceaseless slaughter of human teeth by extraction. Alas for this theory also! accidents are not perpetuated, and the mothers and fathers, who, unfortunately, wear both upper and lower sets of artificial teeth, cannot transmit their toothless jaws to

posterity. Other causes may act to the detriment of children's teeth, but not these when considered accidental. So long, therefore, as the body is reasonably nourished with suitable food, the future halcyon food-days of our friend even, the teeth will most certainly be projected from the foetal into this their extra-uterine life. And, after being properly set in the jaw, their continuance or subversion will depend upon many considerations, so evident that it is necessary to say only this, that in the future, as now, the loss of the teeth, or their absence, will not be constant, complete, or general, but will be due, as now, to causes transient, local, and accidental. Is man to suffer no other loss than that of his masticating powers and possibilities?

Is man to be intelligible in his speech, or indeed, is he to have any speech, in case of such loss of teeth and the sinking in of his cheeks and lips? Is the human face, in the progressive march of human civilization so fervently hailed, to be robbed of one of its chief claims to beauty and use? I do not forget that the teeth are striking together many hundred times during our waking hours, which act is sufficient to maintain, at least, a vital electric current through them, and it is wholly unjustifiable, while the teeth are of the body, to consider them as out of use, even if food should be entirely liquid. All bodies are electrical, or capable of conducting or repelling this force. The teeth are good conductors, and are subject to certain electrical conditions. In teeth-chattering, we see a peculiar electrical condition of the motor nerves, in which they cause the teeth to click together like a telegraphic machine, and we read the telegram by sound, that the nerves are poorly off, that therefore the body is cold from ague, exposure, or fear. This electricity is a vital force in the body, and governs the teeth as well, and can sustain them against all harm when certain harmonic laws are better understood and applied by us. We see the action of this great force in mastication as follows: the teeth are charged by the electrical current generated by the acid will of sharp hunger, and the rebound of the jaws in the act of mastication is, in a sense, due to the repulsion of the lower as against the upper teeth, both upper and lower teeth being charged positively by the will in satisfying hunger. When the teeth come in contact through the food, or without the food, both upper and lower teeth being positive,—like repels like,—and the jaws fly open again with a quick and easy spring. The digastric muscle, the tritulators, and elevators of the lower jaw are now, for instance, working in harmony, and as they work, evolve a positive electrical force, part of which force is correlated into heat, and the rest is imparted to the food, which latter act is easily accomplished by means of the moist walls of the mouth and the peculiar qualities of the saliva. This electro-nervous action being communicated by the teeth to the food, the muscles and juices of the stomach too, with the entire aliment-

any canal as well, are brought into co-ordinate action. Thus we see one reason why sharp hunger can so assist in digestion; and another reason why the teeth are important to digestion as well as necessary to mastication. Still, on the supposition of soft food alone, with nothing for the teeth to masticate, their frequent contact at other times, as set forth, might keep up at least an electrical balance, which would not permit them to be hopelessly lost through all time, because of poverty or circumstance of food. The teeth, though they may be saved by little or no exercise, were yet made to bear the burden of considerable labor, and in general respects should, like the inmates of our city's Industrial Home, be required to work for their dinner, for the dinner that is earned makes best blood. However, we must not forget the fact that man, like his teeth, may possess himself of an indefinite number of good dinners and not work for them, and, because he does not repay labor for possession, he nor his teeth are likely by such fortunate treatment to be subverted. We reassert that the teeth will ever be planted in the foetal mandible, and with resistless growth shoot into this outer world, and Nature, knowing these wants, supplies fluid or soft food always for their first years, while the teeth are growing and rounding out their destined proportions. Mastication is a secondary consideration during these first years of the child's life. The teeth are a part of the digestive tract, of course, and are formed cotermporary with that tract, and the child-stomach is mature, so to speak, only when its child-teeth are complete, and not before. In all these years, soft, nourishing food must feed the life of the child; and, more especially to the furtherance of good teeth for the child, is the mother also to partake of nourishing and proper food. The teeth are capable, as other parts of the body, of very robust health from exercise of the entire masticating apparatus; but they do not alone depend for health on the exercise of mastication, which at least, being severe, is only active in all about an hour or two each day, or very much less than even this. Therefore, as long as the body is nourished well with suitable, digestible food, and the mother, while carrying her child, will remember the great forces of health, so free, so boundless and perfect, of good air, good water, good food, a contented and happy mind, suitable exercise and occupation, all of which we have a right to hope for in the coming, and we trust better and wiser days,—with these, there will certainly be given to each child sent into this world the legacy of a good and practical, if not always perfect, set of teeth; and when dentistry grows wiser, as indeed it must,—if subversion by the forceps is not allowed to rule to our shame as a profession, as now it appears to, in many offices,—it will, by certain or relatively certain means, give this or that young person the knowledge of keeping his teeth, with the rest of his body, in good practical health. In those future days, when evolution has

given its last turn in the affairs of mankind, man may not even then partake of the waters of immortal youth. The order of nature will be carried out as in the past, no doubt. Yet, though not given a perpetual life this side the grave, a few trickling streams from the immortal fountain, we trust, may flow earthwards for the comfort and the healing of the nations; when the forceps shall be no longer known save in theory, and the mallet shall not consider the vital human tooth an anvil, and the jaw and its possessor an insensate log, to which this tooth-anvil is fastened. Oh, the happy days to come, when the future patients of a scholarly and reasonable dentistry, with warm gratitude for the beneficent labors of its art and science, in case nature or accident require them in the substitution or protection of the teeth, will not regret the possession or the retention of their teeth as continuing through the grade of their own development! Though costing care and attention, as all things precious should, the teeth will be the passive means of the clearer articulation of man's future speech, and the active sharer of man's future dinners. With regard to some of the phases of thought incident to the contemplation of some of the modern statements of evolution, one cannot but be astonished, at times, at the boldness, to say the least, of some of its conclusions derived from an ever-increasingly bold hypothesis. The somersaults of some of its champions may be properly described by cycloidal curves, which with every diurnal revolution of the earth are progressively carrying the victims onward and onward, still further and further into the vast unknown and the unknowable. Some of these lively theories take the unhappy evolutionist so far from home and fireside that he may never return to friends and companions; and, if returning, like Rip Van Winkle, would not be recognized by those whom he is most desirous should welcome him back. And his dog Schneider also would be lost to memory dear. However we believe from such freedom of thought and imagination much good is to be accomplished, yet, howsoever far the pendulum swings forward, sober and inflexible gravity will draw it backward, till at last, after much agitation and swinging to and fro, the central calm is fully established.

Now, the bold theory on the subversion of the office of mastication, and the assumed subversion of the teeth in consequence, has cropped out here and there lately in the articles of some of our modern journals. And to one that, though progressive himself, would counsel moderation and an adherence to facts and logic, yet may be classed by the more volatile as "old foggy," it appears that we have among us as pernicious a form of *new foggyism* as we have of the old, and the new fogies, in many instances, lack the candor of their ancestors, and both need to seek truth, and accept it for truth's sake alone,—for its merit, not its fashion.

The subject of food and its relation to a *subversion* of the teeth is, we think, a fallacy; for we believe that food has no such relation. That use does not entirely govern subversion is shown in the case of the human hand, like that of the modern belle, or even professional man, for instance, as compared with that of horny-handed sons and daughters of toil. Is its comparative non-use in the first case pointing to subversion *some time*? No; this difference is owing to diversity of circumstance and occupation. Use, more or less, will not subvert the human hand. Without his hand, man is not wholly man. The teeth are unique in physiology and anatomy, for nature has permitted their removal from the human jaw from accident or other cause without permanent injury to the other parts, so to speak. The ease with which teeth may be removed, foreshadows the thought of Nature that they might be liable to disease and injury, and a way must be provided that the one maimed might be removed without injury to the rest; that way was found, but sorry I am that it is being tested so often. The refinement of texture and loss of callosity on the one hand mentioned over that of the other, does not mean at any future time a subversion. In place of bulk and hardness, we have here softness and delicacy of touch for meeting the higher and more complex wants of life and the individual. Increase of man's knowledge of himself will act favorably with regard to the protection and preservation of the teeth against loss by subversion. Man naturally requires less powerful and continuous mastication in civilized than in primitive, savage, or barbarous life. The effect of such a fact is seen in the delicate, white, shapely, nervous teeth of the present higher grades of civilized man, in his less massive malar, maxillary, and zygoma bones,—the products of a progressively refining influence, and also in the shapely leg of the thoroughbred, for instance, over that of the lower, but physically stronger type of the draught horse.

A more nutritious and somewhat refined food is necessary for active brain-draught of the present age over that of the comparatively idle brain of savage man. There are vital and anatomical considerations that oppose the idea of subversion of the apparatus of mastication, that forbid it, on account of the inevitable death and loss by atrophy that would ensue of the many muscles and nerves that are directly concerned in the movements of mastication, of deglutition, of insalivation, of vocalization, the mobility of the facial muscles, and many more pathological phenomena. It is not enough to say that man shall lose all this, and more, by a gradual perversion of the many wants and instincts that have sustained him thus far; but there is forcing of a conclusion from self-asserted premises to sustain the theory. Finding that the teeth will ever be projected from intra- into extra-uterine life, their destruction after that will be local, individual, and accidental.

Suppression of mastication by the forceps, by dental disease, by

sickness, and other accidents, are included in the above, and it is the true mission of dentistry to *subvert* this order of things.

The survival of the fittest has been a law of men and things from the first. We see it exemplified among all races of men. Yet, would it not be the boldest assumption to say that, by reason of such accidental and abnormal conditions, it taught an entire subversion finally of man as man? Races have come upon and gone from the face of the earth. The ancient dwellers in the cañons of Colorado long since have put out their fires, but man as a species remains, and, we think, more numerous, intelligent, and promising than ever. If such be the case, the teeth as part of this man must partake of his peculiarities of condition; and certainly better food, even if it be more fluid in its consistency than now, if it works wrong to the teeth and stomach, its effect will be pathological, individual, and constitutional. If a wrong creeps almost unknown up through the centuries, it will exterminate that race that commits it; if the wrong be a physiological one, and sufficiently vital, the distant century-bells of that people, like those of the races that have faded out before them, will tell their doom, and they will meet the penalties of their physical transgressions at last. The teeth will meet theirs, and, not having volition, must submit to the temper of the organism to which they belong. We would also show that the teeth, like the hair and nails, are to be considered as parts of a dermal skeleton. And, according to their genesis as related to the true skeleton below, they may come and go without imperiling the latter; and that their continuance as hair, nails, and teeth, are not subject, in this respect, to the laws that govern the heart and lungs, for instance, and that non-use does not necessarily imply that they will not reappear as they have done in every succeeding child since the creation. Other things being equal, we see in the case of the hair, nails, and teeth, when not subject to severe use and abuse, a disposition to become even more refined and comely, rather than a tendency to subversion. The hair is luxuriant and wavy in its nature, the nails are fine and shapely in the hand not used to labor; and the teeth of the belle we have shown to be the most beautiful, whether as regards form, whiteness, or perfection of structure, and, as I have so many times seen, in the matter of soundness as well. These three products of the dermal skeleton serve man in useful ways, but, especially as regards the hair and teeth, they may serve also the highest use as ornaments to the body.

Nature does not consider beauty incompatible with usefulness. She is equally devoted to both, and in this divinely beautiful and dual trait, neither use nor beauty will be allowed to entirely subvert the other in opposition to the general plan and scale of creation, whether we speak of bird, of tree, or of man and *his teeth*. The advance of dentistry in the last century has shown that the teeth, so long neglected, have

become worthy of notice, and that the true principles of dentistry are to save the teeth, not to destroy them. If, therefore, in the advance of civilization, dentistry and the collateral wisdom of medicine are not able to cope with a fast disappearing teeth and digestive function, and probable extinction also of that race so abusing its privileges, one would say that such a people cared more about pet theories than homely but wholesome facts; that their boasted wisdom was a mockery and their science a misnomer. We are also informed by the article so frequently alluded to, that "natural sources of food are already beginning to be felt inadequate to the demand, and nature being powerless to respond to the coercion, science must come to the rescue." I do not admit that nature is powerless to respond to coercion. A farmer that makes two blades of grass grow where only one grew before, proves the incorrectness of this statement. Nature is ever provident. The shiftless, the miserable, the contemptible, the lazy, and good-for-nothing specimens of mankind will always complain. They insist that the "world" owes them a living,—which means that other folks owe this debt. The faithful husbandman and the earnest worker in the vineyard are both worthy of their hire, and Nature has been and ever will be respondent to the cry of her children in the deep future no less than she has been in the past. The stomach, it is well known, must have a certain amount of coarseness and bulk of food to act upon, to keep in health. Nature provides the fiber of the vegetable, and the more quickly dissolving tissue of the animal. Therefore, by this also, we see that man, as man, subject to the conditions of his nature, must ever have the power of mastication for his stomach's sake, and through that, his own (so far as concerns his physical development) strength, health, happiness, and longevity. Further, also, we observe that the grinding teeth of man are in number as twenty to thirty-two, or about two-thirds the number, telling us by an eloquent silence that man must or may grind his food. This act we understand by the term *mastication*, which is a fundamental and vitally essential act in the very condition and necessity of his existence. Man is cosmopolitan, roaming over all lands, inhabiting all climes, and eating all foods, and is not to be hampered, therefore, with an omnipresent soup-dish and a box of matches, however theoretical they may be, to reduce by fire and water everything of food-nature into the condition of gruel, slops, or porridge. The flexibility of man's endowments does not put him to such straits as these; and further, this monotony of fluid food, so at variance with the pressing wants of his body, would be repudiated. It would not be called desirable or wise to use soft diet solely. The tender quail, the fragrant venison, and the fish life of river and sea, and the vegetable and animal diet of domestic culture, must, as now, be ever grateful to his hunger, and to his teeth as well. Less

mastication means, in a general sense, simply less wearing of the teeth in its service; while in teeth of old tobacco-chewers, for instance, we see what the effect is at the other end of the scale,—teeth firm and strong, may be, but much worn and unsightly.

Let us therefore, finally, cherish the thought that with a wise care and regard for the health of mind and body, the teeth cannot in any event greatly suffer; but that anything tending to a final destruction of these important organs will not alone affect their destiny, but as well that of the entire organism of man.]

OXYCHLORIDE OF ZINC.

BY F. M. DIXON, D.D.S.

(Read before the Odontographic Society of Pennsylvania.)

I QUESTION if there are any in the profession who have not been convinced that, notwithstanding the fact that gold in some of its prepared forms is unquestionably the best substance known to science for filling cavities of decay in human teeth, yet, in consequence of the many serious objections and difficulties in the way of its general use,—objections and difficulties too well known to all, and too frequently discussed, to need here more than a passing notice,—it cannot but be clear to every thinking mind among us that there must exist in nature's laboratory somewhere a substance or number of substances which, separately or combined, possess all the requisite qualities of gold, yet lacking all—or at least many—of the objectionable features of that metal.

If this conclusion be correct, no one, I apprehend, will for a moment hesitate to acknowledge that it is the duty of every intelligent man of our specialty to do all that lies in his power to bring to light and usefulness some substance that can be well packed in a tithe of the time needed for making a good gold filling,—a material that will afford still better hope than gold does of saving for life delicate and frail teeth, by reason of its easier and greater adaptability to the varyingly-formed walls of cavities, and its greater compatibility with all the conditions, because of its greater affinity, as it were, for dentine, enamel, and possibly even for nerve tissue, because of its less ready and less troublesome response to thermal and perhaps galvanic influences; and last, though not least by any means, by reason of its greater availability in the hands of only moderately skillful operators, and by reason of lesser cost bringing it within reach of worthy sufferers who must to-day, by reason of the necessarily expensive character of elaborate operations in gold, suffer the loss of their teeth often ere they have reached middle life,—thus bringing dental care within reach of a greatly increased number of sufferers from the effects of decaying teeth.

Dental practitioners have been within the last decade or two so in love with the interesting art of making beautiful gold fillings (the power of which fascinating influence over my own mind I am constrained to acknowledge), so bent upon the, perhaps laudable, effort to outdo every competitor for honors in this direction, that I am not by any means sure we have not thought and labored too little to secure so great a boon to suffering humanity. If those of us who, though not strictly scientists, inventors, or discoverers, know the needs of humanity in this respect, had thought, talked, written of, and worked for this end, experimenting with the different substances offered as substitutes for gold, finding out their good and bad qualities, making to each other such suggestions as experience may have dictated, setting forth as forcibly as possible the great need of such a material, the great blessing it would confer upon humanity, the great honor it would secure to the inventor or discoverer, I do believe that ere this we should have been in possession of the perfect thing, so long sought for and so earnestly desired, a filling material so superior to gold that the yellow, hard-to-work, untoothlike substance might, for all the dentist need care, remain in the mine or the mint; and the then much more useful dental practitioner would greatly rejoice in his ability to save a hundred teeth where he now saves one, and with much greater ease pursue his noble calling; while rejoicing communities on every hand would rise to call us, if not blessed indeed, at least by better sounding titles than those by which we are now often designated, after thumping for from thirty to one hundred and thirty minutes at a tooth, to pack, it may be, the most solid and best gold filling that was ever inserted into a cavity.

Having for many years felt conscious of the great objections to gold for fillings, or rather the insurmountable obstacles in the way of its use in a vast number of cases where teeth might and ought to be saved that are not, if we had in possession a substance just as reliable as well-used gold, one that would pack with about the ease with which Hill's stopping can be inserted when used under the most favorable circumstances, I have long been in the habit of fairly testing anything offered which I could safely experiment with, hoping always that it would prove to be the article my very soul desired so earnestly.

While I am forced to acknowledge that there is, as yet, nothing known that may even partially take the place of gold for permanent fillings, I am also constrained to say that oxychloride of zinc, in some of its offered forms, has proved so useful to me, lasted so well, and is to-day doing such excellent service in many cases where I have succeeded in properly applying it, that I feel justified in urging upon all who have not yet done so the importance of taking it in hand at once, experimenting faithfully with it, and striving by every practicable means to have it improved, as well as to discover the very best manner

of using it as it is, to learn what good qualities it has which have not been made known, and whether it is not so nearly the desideratum that, with some ingredient added which some one of us may have the good fortune to discover, it will prove, after all, to be *the thing* which, in the hands of the honest, capable dentist, is to subserve in large part the great purpose for which the profession exists. It would doubtless be considered a work of supererogation were I to enter into an explanation of the chemical and mineral characteristics of this compound. Suffice it to say that, as to the oxide, no one has, I believe, ever made any charge against it of incompatibility or disagreement with any of the constituents of the human teeth or their surroundings. Of the chloride I cannot, of course, say as much, although from my own observation I must acknowledge I have no reason to fear it on hygienic grounds. On the other hand, I have, I think, excellent reason for believing it more beneficial than hurtful to sensitive teeth whose pulps are in a healthy condition and not actually exposed, and I am by no means sure that if judiciously used it would not prove beneficial even then. Why not? Is it not astringent, disinfectant, and antiseptic? If I am not much mistaken, it is all of these; but remember I do not assert its beneficial effect upon exposed pulps. I am not prepared to enter the controversial arena with those who may doubt or deny it. My aim is to stir up inquiry and investigation, by which the facts may be reached, even though the conclusions drawn from my observations should prove erroneous and valueless. Every new experience in its use, even with cases the most critical, has served more and more to strengthen my favorable impressions of it, until every vestige of doubt has been dispelled from my mind, and I now use it (where I believe the pulp to be in perfectly healthy condition and not exposed) without fear of evil consequences,—in fact, as I would use gold or tin-foil,—the only failure which I have met with in the last six years having been purely accidental.

The first evidence, to my mind, that oxychloride of zinc, carefully used, was not inimical to pulp life was presented in a very singular manner, an account of which will include a history of the greatest blunder I am conscious of ever having made in the treatment of a sensitive tooth. I have always looked upon the unnecessary destruction of the pulp of a tooth as a very near approach to a criminal act, and have always thought it my duty to do all in my power to maintain, where endangered, the life of a tooth. Yet in the instance alluded to, through ignorance of certain facts in the case, I committed that sin.

It was in the early days of my experimentation with oxychloride of zinc. I had applied it to a very sensitive tooth with a nearly-exposed pulp. The pain for fifteen minutes after the operation was intense, after which the tooth seemed to remain for some months perfectly

well; but at the expiration of this time the patient returned in much pain and with symptoms of congestion of the pulp, having no doubt whatever that the pain originated and continued in that tooth.

Being very busy at the time, but anxious for the patient's comfort, I, in my hurry to remove the filling, broke through the very thin layer of dentine that had remained over the pulp, which, to my surprise, seemed perfectly free from any appearance of disease whatever; yet there it was, staring me in the face, bleeding slightly, and, as the patient thought, aching furiously.

Having suffered greatly from the effects of decaying teeth and their careless treatment, he was naturally very impatient, but manifested every symptom of genuine suffering. I had at that time no faith whatever in my ability or in that of any one else to restore to its normal condition an exposed pulp. With a hope of relieving him immediately from suffering, I applied arsenical paste, but twenty minutes passed without bringing the slightest relief, and the patient went home to bear the pain until the pulp should be devitalized. On his return the next day I found to my mortification that he had been suffering ever since, or with only occasional intermissions of a few minutes' duration.

I had not been in the habit of resorting to systemic treatment in such cases, and in this instance there was not the slightest indication of its need, nor was there such need, as the sequel will show.

Being completely mystified at the continuance of pain, even after removal of the pulp, which I now found devitalized, I for a second time commenced searching for its cause elsewhere, thinking it possible that the trouble really arose from another tooth; I say a second time, for I had the day before thought of this possibility, and made every effort to discover the truth.

There was on the first day of his call no soreness in any of the teeth; there was no apparent change of color; in fact, no possible indication anywhere (excepting the pain) of a dying tooth, and that pain the patient persistently declared to be in the tooth described. On this occasion, however, I found upon percussion that there was decided soreness; not, however, in the second molar (from which the pulp had just been extracted) but in the adjoining third molar. In this there were three, if not four, fillings: on the mesial, distal, grinding, and—I think—the buccal surface. The front and rear fillings were large (not very large, however), nor had I feared for the safety of this tooth when filling it a few weeks previously; but now—as you will readily suppose—my suspicions were aroused (although it is not uncommon to find one tooth sore depending upon severe inflammation or congestion in an adjoining one). The front filling in this case was well up in the neck of the tooth. Remembering all about it, I now forced the blade of a sharp hatchet excavator under the cervical edge of the filling, and soon suc-

ceeded in removing it bodily, when the whole mystery was solved, for the odor of a recently dead or dying pulp, which we all know so well, immediately saluted my nostrils. The pain was all gone in a moment, and when—five minutes later—the patient took his departure he was happy; far more so than I was in the thought of having *unnecessarily* destroyed the pulp of a tooth. Unnecessarily I am sure, for I am convinced that were the patient yet living, the pre-described pulp and tooth would both—having had proper care in the interim—have been in a sound condition to-day, had I left the oxychloride of zinc undisturbed where in good faith I had placed it, though so near the pulp that the thickness of dentine between them would be fully described by the thickness of the sheet on which I am writing.

I am morally certain that in no other case to which I have applied it has it caused the death of a single tooth, though many of them have been as sensitive as any I have ever filled; with pulps almost, although not absolutely exposed, too nearly so to fill with gold without the intervention of a non-conducting substance.

In cases not a few I have packed this material right into the cavities without any intervening protection; in some, for a specific purpose, it was placed very soft,—about the consistency of thin mortar,—pushed before a piece of spunk (as practiced by my friend Dr. Boudrias de Morat), followed rapidly as possible by a quickly-mixed portion, dry as could be worked.

This practice, however, in many cases of exalted sensibility, would be unadvisable—might be reprehensible.

When practicable, the whole mass should be used about as stiff as glaziers' putty, at least, for the less of the chloride used in the filling the more quickly and the harder it will set. The more instantaneously the mass is forced into the cavity after mixing the better, ere the slightest approach to the process of hardening has taken place; for if, after that process has commenced, the particles are disturbed, the hardening will be retarded, and in the end will be much less perfect. "Is it possible," said one in debate upon this subject not long since, "that a tissue so delicate as pulp will tolerate an agent so strong as chloride of zinc—an agent which is used to destroy other tissues?" Doubtless a similar impression upon the minds of many prevents their using it where it would render invaluable service if used with judgment, care, and skill. Permit me here to remind such persons that there is not a poison known which is not also used as a medicinal agent,—arsenic, morphine, even corrosive sublimate,—but used, like oxychloride of zinc, under very different circumstances, and in a widely different manner. The subject is too broad in its proportions for discussion here, and is well understood by most of you; a mere reference, therefore, must serve to illustrate the point I would make.

If I wished to destroy a pulp with oxychloride of zinc, I would make my application in such manner as to secure, rapidly as possible, its absorption into the tissue. But if my object should be its salvation, I might possibly resort to the same agent, but using it in so different a manner as to produce the desired result. If I first mix it with the oxide in proportions that will make a paste so thick that I must work it with great rapidity in order to fill the cavity thoroughly ere it begins to set, I do not apprehend that the processes of endosmosis and exosmosis are sufficiently active to carry into the pulp a perceptible particle of the chloride which might for an instant be freed. Indeed, the supposition from my own experience would be the reverse, as I have rarely known any considerable pain to attend its application, when thus made, to the most sensitive tooth. If it were possible so delicately to place it in actual contact with the pulp as not to press thereon, I should fear no mischief, for I am much mistaken if the very small quantity that could by any possibility reach the exceedingly small exposed surface, if applied as suggested, would not have a beneficial or healing effect. The fact that to gorge the pulp with chloride—of almost anything—would *kill* by *drowning* the poor maltreated thing is no evidence whatever that the one-thousandth part of a drop, reaching its outer surface at a point no larger than the eye of a mosquito, through the medium of a filling properly inserted, would either kill or disagree with it. Moreover, I have occasionally, and for a specific purpose (again where the pulp was so nearly exposed as to render it exceedingly uncertain whether there was not a minute opening into the cavity), inserted the first portion as thin as thick cream, then packed with great rapidity the balance dry as possible; by this means securing a thorough adaptation to the walls of the softer part, rapid absorption of the chloride into the dryer oxide immediately following, and at the same time avoiding any considerable flow of the chloride into the pulp-cavity. I believe that the affinities existing between the two zinc constituents would bring about, under such circumstances, an instantaneous reflow of the liquid of the first part, from the direction of the pulp, into the dryer material of the second, enabling the operator to fairly mix the compound in the cavity, thereby securing the completion of the process of packing before that of setting or crystallization has fairly commenced: a very important desideratum to reach; for compounds of this kind, when disturbed after the setting process has started, will not become so hard as if mixed and moulded rapidly, ere that process has had a beginning.

Too much care cannot be observed in the proper accomplishment of every part of the process, from the preparation of the cavity to the final finishing-off of the filling. One of the indispensable necessities is to keep the cavity and filling positively and entirely dry, not only during

the operation, but for as long a period afterward as practicable; for if the chemical combination is completed and the residue of the chloride thoroughly evaporated before the fluids of the mouth are allowed to come in contact therewith, it will become almost as solid as marble. In order to effect this object I avoid, if possible, placing the elastic cloth over any other than the tooth about to be filled, cutting the hole through which the tooth is to be passed as small as it is practicable to get the tooth through without tearing the rubber; tying—if possible—considerably above the cervical margin of the cavity, with a hard twisted linen thread, large enough to secure against the danger of pulling the elastic over. After packing as described, I press on to the exposed face of the filling as much of the dry oxide as practicable, with a view to absorbing as much as possible of the chloride.

I then draw the elastic over the tooth, tying it firmly over or under the grinding surface, cut off with a pair of scissors the surplus, and send the patient home with the filled tooth tied up in a rubber sack so securely that when the string is cut, any number of hours afterwards, the oxide that was in a dry condition over the surface will be found as free from moisture as when placed there.

I then cut, with suitable instruments, the surface into its proper form, polish carefully, and the work is completed.

And now, gentlemen, lest I may be misunderstood, let me remind you that these fillings are not recommended as permanent where gold can be successfully used, though I hope and believe the day is not far distant when this compound will be so improved as to render it available even as a substitute for gold in a vast number of cases for which gold only is now considered the proper material.

I would next draw your attention to some of the cases for, and circumstances under which, I consider oxychloride of zinc invaluable,—not as temporary work strictly,—cases where all, I think, would find it subserve an excellent purpose would they give it a fair trial. One of the most prominent of these is where the body of the dentine is almost or entirely gone, leaving a mere shell, especially where there is great irregularity in the form of the cavity, and where there are overhanging walls, or, as frequently expressed, undercuttings.

To fill such a cavity full and well with gold, under-packing completely, and securing against possible leaks, is one of the most delicate, tedious, and uncertain of operations.

Filling such a cavity one-half or two-thirds with oxychloride of zinc (including all its under-cuttings, of course) must, I think, be considered the better practice by far, for reasons too apparent to need explanation: again, where patients come under treatment, for whom there is so much to do as to render it impracticable that all shall be accomplished within the time that you or they can properly devote to a single siege, espe-

cially where the patient's health is such as to forbid a series of long operations with gold : again, where there is a good reason for wishing to divide time, labor, and expense between the present and a series of following years, what a comfort to both patient and operator that the larger cavities can now be filled with this material, knowing that, if properly done, it will save not only a large outlay of labor and strength, but that for a number of months, at least,—in many cases for years,—it will render perfectly safe the organ so filled ; and that at pleasure, or when necessary, you can pack over these a plate of gold which, carefully done, will not only look as well, but be as good, if not better, than the best solid, all-gold fillings that could be packed into such cavities. I say better, because of the certainty with which leaks are avoided, and, if the tooth be very sensitive, because of its less liability to the painful effects of thermal changes. But time will not admit of a further continuance of the subject now. I have, however, under way some experiments in numbers of mouths, and am preparing for more, the results of which, I sincerely hope, will be worth presenting, and if they prove so be assured they shall not be withheld.

EDUCATION.

BY C. E. FRANCIS, D.D.S., NEW YORK.

(Read before the Odontographic Society of Pennsylvania, Wednesday, December 1st, 1875.)

ONE of the leading topics of the present day that particularly concerns our profession is the subject chosen for this paper. Especially within the last few years has the question of educating the profession been held prominently before us, and more than ever before are we disposed, nay, compelled, to give it due consideration. The days of empiricism are fast fading away, and the men who at present practice dentistry successfully, or who are recognized as the leading lights of our calling, are they who have been fitted for their duties by a thorough course of systematic educational training.

Little more than a quarter-century ago dentistry was hardly considered a profession. Very few dentists were regularly or properly fitted for their vocation. Dental colleges and dental societies were in the first stages of conception,—experimental ideas in process of development, or probabilities just under consideration. The majority of men who operated on teeth were those who, having met with ill success in other pursuits, and deeming the practice of dentistry an easy and respectable way of earning a livelihood, entered upon their duties with little or no preparation. A few days or weeks were, by many, considered a fair season of pupillage, and the "art of dentistry" was taught

for a slight pecuniary consideration in a brief space of time. The requirements were simple. It seemed only necessary to possess sufficient skill to extract aching teeth and supply their places with some sort of artificial substitutes, together with the ability to stuff a little gold or tin into cavities of teeth slightly decayed. With such crude and imperfect preparation the newly-fledged dentist would gather together a few instruments, and announce himself competent and ready to meet whatever demands were made by his patients. Of course there were notable exceptions here and there. A few men of scientific attainments were early in the field, and through their efforts the whole mass, to a certain extent, became leavened. These honored pioneers seemed determined that dentistry should purge itself of empiricism and take its position among the learned professions. The spirit and enthusiasm they manifested spread like a contagion, and the advances made in the science and art of dentistry within the last quarter of a century have no parallel in the history of any other profession. Colleges for educating students in this specialty have been established in various parts of the country, and each successive year has shown not only an increase in numbers of students, but marked improvements in methods of instruction. It is gratifying to feel assured that this determined perseverance on the part of our leading spirits, to place dentistry on its proper footing, is each year waxing warmer, and there is little fear that such commendable zeal will abate in the least until students of our special calling stand side by side, acknowledged and *universally* recognized as peers in every respect to students in any other department of medicine. We already discern marked evidences of such recognition, and dentistry is fast proving its claim to a position of honor among established professions. Our leaders have learned that *education* is the chief qualification for this position, and to it do they bend their energies with untiring persistency.

But what sort of education does the student of dentistry require? Here seems to be a question upon which doctors do not fully agree. The requirements that the coming or ideal dentist must possess are more numerous and of greater significance than are usually demanded of members of other professions. He is expected to acquire an education equal in nearly every respect to that of the general practitioner of medicine,—acquainting himself with the institutes of anatomy, physiology, histology, pathology, and therapeutics; becoming familiar with the records of *materia medica*, besides acquiring a fair knowledge of chemistry and metallurgy. And with these he must possess the ingenuity and nice mechanical ability of a skilled artisan. In short, he must be physician, surgeon, and artisan combined! This seems to be the requirement demanded of the student of dentistry; and yet *some* of our cousins of other specialties have evinced a degree of sympathy refresh-

ingly cool, and are disposed to extend their nod of favorable recognition only to those who sport appendages similar to their own; theirs being, as they imagine, of more elevated caste.

Wherein this superiority lies it is difficult to see, for that the degree of M.D. carries greater weight than D.D.S. is an idea not consistent with reason. Attaining the degree of M.D. alone would indicate that the dentist possessing it was but *partly* fitted for the practice of dentistry. His titular appendage might imply "mid-way dentist," although not necessarily "miserable dentist," as has in past times so often been asserted. Strange that any dentist should prefer this title to one which denotes a more thorough training for the special practice he pursues. As dentistry is now taught in our first-class institutions, it seems hardly more important for a student who intends to make this specialty his sole occupation to acquire the additional degree of M.D. than to aspire for the degrees of A.M. or LL.D. If, as has been asserted, the degree of M.D. is of greater significance, *why* is it so? Is it more difficult to obtain? We think not. Are students of medical colleges of a more exalted type of character, socially or intellectually? Whoever examines the different schools will find that dental colleges do not suffer in the slightest by comparison.

It has been said that "dental colleges are not of the highest order,"—"that they have not reached the point of perfection in methods and thoroughness of instruction." Yes; but do not the managers of these institutions admit this to be so, and, admitting it as they have from the first, have they not carefully scrutinized their defects with a view of correcting them and making their schools nearer perfect? Has such progress as they have shown in this direction been surpassed—aye, even equaled—by others? Are the medical schools already so perfect that they are not susceptible of improvement? What great progress do their calendars for the last score of years exhibit? Do they turn out better physicians or more thoroughly educated men than were graduated quarter or half a century ago? It is very much doubted.

Medical colleges do not grow as rapidly in this respect as they should, and hardly keep pace with the progress of the times. Now, why is this so? Apply the same answer that is applied to us,—"*Because of the insufficiency of their requirements.*" *Until medical colleges refuse to admit as matriculates young men who hardly possess a common school education, they or their disciples can ill afford to throw stones at their neighbors' houses, or indulge in vain boasting.*

Why should not physicians as a class possess a general education equal to members of other professions? What proportion of the students of medical colleges at the present time are graduates from universities? I regret to say that men can be found among them who are entirely destitute of any scientific or literary attainment whatever.

Young men from farms, workshops, stables, and other obscure places, who can barely read and write, find easy access to many of these schools, and plenty of such may be found among the matriculates.

Why not essential that men to whom are intrusted the lives of so many individuals be as well developed intellectually as lawyers, clergymen, and others? It seems but proper that physicians should be men of the highest order of mental culture, men of more than average intellect, men of refined tastes and manners, men of real scholastic attainments!

Oral surgery is a branch of the "healing art," a specialty of medicine. All disciples of Æsculapius, whatever their specialty, claim to be members of a *profession*. The same rule that applies to one branch is applicable to all.

Whether dentistry or oral surgery shall be taught in the various medical colleges in connection with general medicine, or only in independent dental colleges, is a question which *time will solve*. It is not my purpose at this time to discuss it, but in justice to the latter I feel bound to say that they have done immense credit to themselves in their efforts towards educating members of our calling and bringing up the standard of dentistry to its present condition. The work, however, is not yet complete, although they have accomplished so much.

From the incoming of future members we shall look for a still higher standard of professional excellence or elegance. Let our colleges take one more step forward in their efforts to elevate their profession. "Compel every applicant for admission to show evidence of possessing not only a good moral character, but a thorough academical or university education." In doing this they will take a most important step forward, and students thus graduated would be rightly and undeniably entitled to positions of eminence in the world of professional men. Then, too, would a well-defined line of demarkation be clearly drawn which would do much towards cutting adrift and casting aside illiterate empirics, and would greatly check the malpractice of unprincipled charlatans.

In looking over "announcements" of the several schools, it will be observed that as a "qualification for graduation" much stress is placed upon the actual time students must be connected with their institutions. Viewing this in one light it would appear perfectly proper, yet it suggests a degree of unfairness that seems not to have been fully considered. Now, why should not preliminary preparation or natural ability be of paramount importance?

It is a well-known *fact* that some students on entering college are intellectually "head and shoulders" above others, and become further advanced at the termination of a single session than others prove to be at the end of their second or third term. Indeed, men are occasionally

found among matriculates who, even prior to entering, would pass a very creditable examination before an intelligent faculty, but who, on entering their class, must in many instances take rank with the unintelligent neophyte.

Why would it not be well for every applicant to undergo a preliminary examination before being admitted, and receive due credit for true merit,—not subjecting all to the same routine, or making it obligatory for those already well advanced to conform to needless measures merely for the sake of formality?

But in all cases let examinations prior to admission or at the close of a prescribed term be thorough and searching. Let such examinations, rather than a fixed period of pupilage, be the test for qualification; and permit no student to pass a board of examiners and receive their indorsement until he is surely qualified to fulfill the duties of his profession, and well prepared for the great mission before him.

Are examinations in medical or dental colleges uniformly as searching as they should be? Unquestionably some of them are so,—perhaps in each school thoroughness is claimed. Without impugning the motives of any college faculty or casting reproach upon any particular institution, I am, nevertheless, constrained to say that, in an extended intercourse with professional men, it has been my lot to meet with a goodly number of gentlemen who in great glory have paraded their titles, which it is fair to presume were for some reason conferred upon them, but which, in these cases, had a decidedly empty meaning,—degrees of M.D. or D.D.S. appended to the names of individuals who, when interrogated, were unable to intelligently answer even the simplest questions relating to medicine or oral surgery! Such persons, and they are not few, tend to lessen the value of diplomas in the eyes of the observing.

May the subject of education, general and special, be constantly agitated, and its principles consistently applied; and may the time be not far distant when the practice of dentistry shall be regulated by specific legislative enactment in every State of the Union; when every member of our profession (who has not already done so) shall appear before a just and competent board of examiners to prove his fitness to practice oral surgery, and when every new-comer shall be compelled to enroll himself as a student in some reputable college where dentistry is taught.

"Establish *compulsory education*?" Yes, gentlemen; I am heart and soul in favor of compulsory education *everywhere*. A sound and sensible common school education for the masses; a broad and liberal education for professional men.

"Compulsory education"—the hope of our nation in view of its future prosperity; the hope of our specialty in its fullest sphere of future usefulness!

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR MEETING, EXTRA SESSION.

(Continued from page 262.)

TUESDAY, December 21st, 1875.

Afternoon Session.

THE secretary read the following paper, entitled "Pressure and Contact as Causes of Dental Decay," by Henry S. Chase, M.D., D.D.S., of St. Louis, Mo.:

From observations continued during the practice of my profession for the last thirty-one years, I must say that the consideration of the two factors, contact and pressure, demands an amount of attention surpassed only by that which takes cognizance of those causes which produce imperfect genesis and development of the dental organs.

In what I now have to say I am aware that I shall state only that which I have advanced on former occasions; but, as "line upon line and precept upon precept" seems to be as necessary in modern times as in the days of the ancient philosophers, I am content to do so. And if I dogmatize, it is only the result of convictions founded on my own experience and observations.

We do not live in a state of nature. That which we call a natural condition is only the result of the long struggle of man with his adverse surroundings and an effort to adapt himself to the conditions in which he finds himself, with those adaptations or modifications of organism impressed on thousands of generations and intensified by inheritance. For, by observing the state of the physical organism in the savage man of the near-past generations, we find that the teeth are in contact without lateral pressure.

Therefore we may say that it is the *natural* condition of the teeth to be in mutual contact. In the savage state the teeth do not decay, as a rule. The mode of life is such that the teeth have been well generated and developed. Furthermore, the diet of primitive man was such as to cause no acid formations in the mouth which might prove destructive to the teeth. Thus, in this primitive or natural condition, there was no dental decay, notwithstanding contact. Contact, alone, is not a cause of decay; but contact, combined with unfavorable physiological and chemical conditions, is a great source of dental destruction.

Modern man has teeth inferior in both anatomical and physiological structure to primitive man. Fissures of the enamel do not belong to the perfect development of the teeth found in uncivilized nations. A more perfect condition of calcification is also found in those teeth than

in those of modern civilized nations, as is seen in the greater specific gravity of the former.

The genesis and growth of the teeth, together with the diet of primitive man, being in perfect harmony, the result of mutual adaptation and heritage for untold ages was to render contact innocuous. Modern or civilized man has the reverse of these conditions, and the results are decay and disease.

PRESSURE.

Primitive man and savage nations of the near-past were exclusive in regard to their intercourse with other tribes or nations.

They neither married or gave in marriage to other tribes, except on rare occasions.

As a consequence, the teeth were in perfect harmony with the jaws and each other as to topographical relations. That harmony had become fixed by in-and-in breeding.

The type, by inheritance, became confirmed. Civilized man, by his promiscuous intercourse, has invited outside marriages; and by cross-breeding, without regard to the *law* of breeding, the teeth of *modern* Americans, especially, are not in harmonious topographical relationship.

By the extraordinary influx of all nations into these States, the immigrants of Ireland and Germany especially, the teeth of Americans of to-day are the resultant of the intermarriages of these foreign people with those of the old Anglo-American stock, giving us at this time millions of dental arches crowded and decaying.

There has always been an excess of foreign males over females. A much larger proportion of foreign males have married American females than have American males married foreign females.

The Germans have larger teeth than the Anglo-Americans. The teeth of the progeny of a German male and an Anglo-American female seem to be too large for their maxillæ. The German male gives the locomotive system and the skin, hair, and teeth, while the Anglo-American female gives the nutritive system and maxillæ.

At first glance it would seem that the teeth belong to the nutritive system; but it must be remembered that they belong to the dermoid system, being developed from that tissue.

Those who would like to study the laws of breeding would do well to read "Walker on Intermarriage."

I practiced dentistry in Woodstock, Vermont, from 1844 to 1857. The population of the country was entirely native and agricultural. The inhabitants were all descendants of the first settlers of Connecticut or Massachusetts. They were a distinct and homogeneous race, having a fixed anatomical type. The size of the teeth was in harmonious relation with the jaws in which they were grown. In my prac-

tice in the town and country I never saw a case of irregularity which demanded the least treatment.

At the present day, in nearly all parts of this country, the population is a mixed one, and cross-marriages have taken place to a great extent, so that there is no fixed anatomical type; and it will require several generations before this result is attained.

We find, at this day, large numbers of children with irregular and crowded dentures; and in adult life, if they are not then very irregular, they are still crowded to such an extent that it is with the greatest difficulty the third molars are erupted, many of them taking abnormal positions, or not appearing at all through the gums. The consequence is undue lateral pressure of nearly all the teeth on their proximate surfaces.

Contact results in decay from chemical disintegration of food left between the teeth, thus producing acids which act as solvents to them. This may be obviated to a considerable extent by great attention to cleansing the surfaces in contact; but in the greater number of individuals this hygienic measure is not practiced. In cases of pressure the same chemical results follow as in contact. But those hygienic measures which would operate favorably in contact will not produce the desired end in pressure; for in the latter there is caused a physiological change in the enamel by obstruction of the circulation of its nutritive fluids, producing at last a necrosis of that part of the enamel subjected to the pressure. I hope it is unnecessary, in presence of this learned body, to defend the statement that the enamel, as well as the dentine and cementum, has a circulation of blood plasma, giving it vital relations with other portions of the tooth.

My study and observations have taught me that necrosis of the enamel takes place from abnormal pressure. This is more evident in the teeth of young persons than in those of mature age. After enamel necrosis has taken place from pressure, chemical forces play their part with far more effect than when that tissue remains alive.

For, beside the enamel necrosis, and before chemical disintegration of that part takes place at all, in a large number of instances I have found a decalcification of that portion of dentine immediately in connection with the enamel, evidently the result of irritation produced by the decomposition of blood plasma in the dead and dying enamel.

One will often find the surface of the necrosed enamel *intact*, hard, and glassy, and of a color varying from brown to black; but on cutting into it there will be observed only a very thin layer that is hard and glassy. Immediately it will be found that it is softer, brittle, and chalk-like. The farther it is penetrated the lighter becomes the color. When the dentine is reached, that tissue will be found more or less decalcified, but of a lighter color than the enamel. After chemical dis-

integration of the latter takes place, the decalcified dentine succumbs so rapidly to decay that a comparatively large cavity is immediately produced.

What is the remedy? "Prevention is better than cure." Better, because, when applied to the teeth, a cure is not a perfect one. Certainly it is better to have *whole* teeth than those which have been decayed and plugged, even if the operation has been as perfectly performed, in every instance, as the present condition of dental art will allow.

Certainly it is better to have whole and sound teeth, than those which have been filed and cut away on their proximate surfaces. The latter process I shall call *section*.

None will deny the value of plugging. Many persons deny the value of section. I am not one of the latter. But I am in favor of reducing the number of teeth which shall demand either plugging or section. How can this be done? By reducing the number of teeth in the mouth, thereby giving plenty of room to those which remain.

Extraction, then, is the remedy! The question immediately arises, What teeth shall be extracted, and at what age shall the operation be performed? The practice must vary according to circumstances. I think those teeth which are the most liable to decay, and also most difficult to preserve permanently by plugging, posterior to the canines. My experience unhesitatingly points to the bicuspid and first molars. In some cases the extraction of one bicuspid on each side and in either jaw will be sufficient to give the required room. In other cases the loss of both a bicuspid and a molar will be necessary. The mouth looks much better with a bicuspid in near relation to the canine than with a molar in that position, as the transition in size is not so apparent in the former as in the latter case. The fact of the second bicuspid being more liable to decay than the first would indicate *its* extraction, generally; though in the exceptions which may be found the reverse treatment would be the proper one.

The eruption of the first molar being so many years in advance of the bicuspid, our attention will naturally be called to the condition of this tooth. When it requires plugging before the age of eleven years, I think it should at that age be extracted, if more room than the diameter of a bicuspid is desired. And if the first molar is one which would not probably be retained, even by plugging, at least twenty or thirty years, I would advocate *its* extraction, even if the prospect should be the ultimate extraction of a bicuspid at the age of thirteen or fourteen years. If the sixth-year molar is extracted at the age of eleven or twelve, the second molar will *not* tilt forward, but will, in most cases, retain an upright, natural position, and move bodily forward to some extent toward the open space. If this molar is extracted

at the age of seven or eight years, the second molar will nearly always occupy most of the room formerly held by the first.

The proper age at which to remove the bicuspid, it seems to me, is at the age of thirteen or fourteen, at least, after the full eruption of the second molar,—that we may be able to judge *which* of the bicuspid, ought to be extracted.

Without doubt the majority of people value the canines and incisors above all the other teeth. Their perfection is greatly desired. The condition of the six anterior teeth, then, regarding pressure or caries, should lead the dentist to decide whether to extract the first or the second bicuspid. I have often found that the removal of the latter would relieve the condition of pressure by the movement of the first bicuspid posteriorly into the second bicuspid space.

THE WISDOM-TEETH.

I have frequently observed that bicuspid, which have been only in contact previous to the development and eruption of the third molars have afterward suffered from pressure caused by the forward movement of the first and second molars. Even the incisors feel the effects of this forward movement, the effect of the *late comers*.

The wisdom-teeth are erupted after mal-condition of the previously-formed teeth may have taken place. Poor as their organization generally is, we cannot choose between *their* extraction and that of the first molars, for the purpose under consideration, owing to the fact of their later eruption. But defective as we find them, they are of easier preservation than a decayed first molar or bicuspid, provided the latter is diseased on the proximate surfaces.

If these wisdom-teeth receive proper professional attention immediately after eruption, they are usually as lasting as any of the other molars. I have often observed them in mouths where the other molars and bicuspid, had all been lost by decay.

GENERAL OBSERVATIONS.

I do not regard the violation of the laws of cross-breeding as the *only* cause of irregularity or pressure. Undoubtedly there are other causes. Among these I would suggest the rapid intellectual development of the race, causing a retrograde evolution in regard to the size of both jaws.

Is not the vital system, as a whole, undergoing the same change? Are not the changes which have taken place in the food of civilized man among the causes for a diminished vital system? Has not the change from the diet of the savage and hunter to that of the modern confectioner produced a smaller jaw?

When I speak of *circulation* in the enamel, I mean a movement of the

nutritious portion of the blood through the animal basis of the enamel-fibres to that extent which will give it regular nourishment. It matters not whether that movement be a rapid or a sluggish one, or whether the fluid circulating in the enamel is changed hourly, weekly, or yearly. It is enough that there is a circulation, and that nourishment of tissue is secured by its means.

It must not be supposed that I advocate the universal practice of extraction, which I have detailed. I expect men will use "common sense" in this, as well as in other matters of professional judgment. At the age at which I have recommended the operation of extraction, it must be observed that the full growth of the jaws is not attained. By seeing both the father and the mother of the child, it may be noted which has given the locomotive, and which the nutritive, system. If the father has given the locomotive system, then it may be judged with certainty that the mother has given the nutritive or vital system. If she has given the nutritive system, then she has, with great probability, given the maxillæ. The size, then, of the maxillæ of the now child, at adult life, may be determined by those possessed by the mother; modified, it may be, to a slight extent, by larger or smaller locomotive system of the father. The same principles apply when the father has given the nutritive system and the mother the locomotive system.

As before remarked, man on this continent is in a transitive state. It will be a long time before the race *here* will become homogeneous.

It is during this transition period that I think the practice which I recommend will be advantageous.

It is probable that no one can tell what the future anatomical condition of the maxillæ will be.

That they might be shortened after the lapse of many generations, by constant extraction of the teeth at an early age, and by "in-and-in" breeding, I do not doubt; but long before that the race will have become homogeneous, and harmony will prevail between the teeth and the jaws, if no other disturbing cause interferes.

One disturbing element I have already hinted at, namely, the *intellectual* growth of man to the exclusion of his *physical* development.

With the increase in the capacity of the brain-case there seems to be a decrease in the size of the maxillæ.

The substitution of food which requires but little exercise and power of the masticatory muscles will, in a long series of generations, at least diminish the size of the jaws.

This evolution of food is now going on with regard to the *Race*, without regard to the intellectual development of the *Individual*.

Dr. N. W. Kingsley read the following paper, entitled "Practical

Lessons in Comparative Odontology," by Charles S. Tomes, M.A., M.R.C.S., of London, England:

The Royal College of Surgeons of England has required, as a part of the curriculum of a dental student, that he shall attend a course of lectures upon "Dental Anatomy, Human and Comparative;" and it has often occurred to me, in the discharge of my duties as lecturer on that subject, to be asked the question, "What is the use of learning about the teeth of creatures other than man?"

The notes that I have hastily thrown together in this paper will, I hope, serve to point out the direction in which lies an all-conclusive answer to that question; the study of one single form such as man, if it be carried out with an almost superhuman painstaking, will lead to a knowledge that, so far as it goes, will be true enough; but if that same amount of study had been devoted to a more widespread survey of animal forms, a far deeper insight into the nature of the phenomena would have been attained.

If we are desirous of understanding any phenomena of life or development, we find its study beset with difficulties. The change we wish to investigate takes place, not in isolation, but in the midst of innumerable other changing conditions, any or all of which may influence it. Consequently, we are forever at a loss to say whether this or that particular thing is an essential, or is present as an accidental coincidence.

Here it is that comparative anatomy steps in to help the physiologist; for by tracing out the phenomenon which is under observation, as it is seen in different creatures, we find it occurring amidst surroundings which are varied or simplified; and thus we have the means of discovering that some of the things which, in one creature, appeared to be essential elements, are, by their absence in other creatures, proven to be non-essentials.

No one, however familiar with the human (or indeed the mammalian) enamel organs, would have been able to rightly determine what was the importance of that stellate reticulum which forms so large a part of its bulk; yet a study of the development of enamel in reptiles and fishes proves that perfectly organized enamel may be and often is developed from enamel organs which have it not at all.

Without seeking further to justify what is an almost self-evident proposition,—that the study of comparative odontology is capable of throwing much light upon human dental anatomy and pathology,—I will jot down a few of those instances which occur to me; but I must disclaim all pretensions to writing an elaborate paper upon a subject which, as yet, is almost untouched ground.

THE ATTACHMENT OF TEETH TO THE MAXILLARY BONES.

It has for some time been well known by those who have given special attention to the matter, that the alveolar processes—those portions of the jaw-bone in which the teeth are imbedded—are developed around and in subservience to the teeth.

The fact that the teeth do not come down to take places in a previously formed bone, but that they come down first, and that the bone which forms their socket is plastered on about their roots and necks, seems to have been perceived by John Hunter; but it was first pushed to full demonstration by my father in the opening chapters of the first edition of his "Dental Surgery." I have, as a teacher, often found it difficult to impress upon students either the fact itself, or its full significance; and it therefore seems worth while to illustrate it from the stand-point of comparative odontology.

While engaged in studying the development of reptilian and batrachian teeth, my attention was caught by the fact that the method in which their teeth became fixed to the bones was by no means so simple as had been supposed. If any of the current descriptions be taken, we shall find it alleged that the teeth become ankylosed to the bone by the ossification of the remains of the tooth-sac or capsule.

The process is by no means so simple as this. When the new tooth comes into position upon the bone, there is a very active development of actual bone, continuous with that of the jaw, and altogether outside and beyond the limits of the tooth-sac. It is to this new bone, perfectly distinguishable even in dry sections, by its coarse structure, and the different direction of its lamination from that of the rest of the jaw, that the tooth is fastened on; and for this new bone, developed anew for each tooth, and swept wholly away after the fall of that tooth, I have proposed the name of "Bone of Attachment" (Fig. 1).

In quality and texture it varies; but in all the ankylosed teeth which I have examined,—and they are not a few,—it is present; and no tooth is fixed directly to the jaw without its intervention; while in all, its history is the same. It is developed for one individual tooth, and when that tooth is shed it also is soon absorbed, and utterly swept away down to the level of the true jaw-bone.

In the class of Fishes a transition from the attachment by ankylosis pure and simple to that by implantation in a socket is to be found. In the cod tribe each tooth seems at first sight to be perched upon the apex of a little cylinder of bone (Fig. 2). The bony pedestals are developed for each individual tooth, and when that tooth falls, they are swept off down to the general level of the jaw-bone.

On close examination of such a tooth as that of the haddock, the bony cylinder is found hollow, and within its hollow portion is con-

tained a prolongation of the base of the tooth and of the tooth-pulp.

FIG. 1.

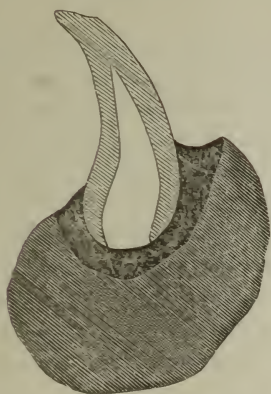


FIG. 2.



FIG. 3.



FIG. 4.

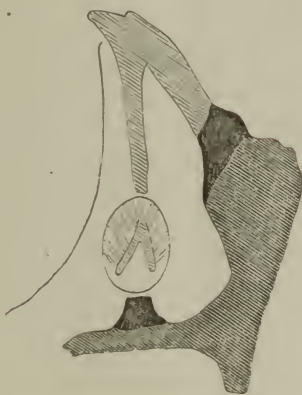





FIG. 5.



-  Tooth.
 Bone of jaw.
 Bone of attachment.

1, Attachment of tooth of a Snake (Python); 2, Attachment of tooth of Haddock, approximating to a socketed implantation; 3, Attachment of tooth of Mackerel; 4, Tooth and jaw of Frog, showing the absorption of one side of tooth, in order to give passage to the young tooth-sac, which is passing into the pulp-cavity of the older tooth, there to complete its development; 5, Attachment of Human tooth, the dark portion representing the bone of the alveolar process.

If we study the development of these hollow bony pillars, we find that until the forming tooth has attained to nearly its full length there

is no trace of this bony support; but then there suddenly shoot up from the subjacent jaw-bone processes of bone which form a network around the pulp at the base of the young tooth, and ultimately, by the coalescence of the fibers of the net-work and the filling in of its meshes, a complete bony cylinder is formed.

With the details of the process we are not at present concerned; the point to be kept steadily in view is, that in attachment by ankylosis—formerly described as a process of such simple nature—we have each tooth becoming developed and placed in the position which it is destined to occupy, without being very directly influenced by the bone near which it lies; and that when it has become so placed, new bone shoots up from the surface of the old to meet it and secure it in its place.

In the mackerel (Fig. 3), the teeth are situated along the thin, sharp edge of the jaw, which is in reality furrowed. In this furrow the teeth are developed, and when they have attained to the proper size they rise up so that their points protrude above the surface of the mucous membrane.

In this new position they are fixed by a sort of bony scaffolding,—interlacing processes of new bone shoot out from the walls of the furrow in the edge of the jaw-bones, and, attaching themselves to the tooth, fix it in position.

Without going into further details, the point which I wish to render prominent, is this: that when teeth are becoming attached to the bone by the simplest method with which we are acquainted,—namely, by ankylosis,—we have a considerable variety in the details of the process; but there is one fact underlying all these variations, which is, *that in every instance the tooth is attached by a new growth of bone, considerable in amount, which is developed for that one particular tooth, and which, after the loss of that tooth, again wholly disappears.*

And it appears to me that it is no far-fetched parallel to apply our knowledge of this fact to the elucidation of the development of the sockets of the mammalian teeth; while it is not to be forgotten that, long before this peculiarity in the attachment of ankylosed teeth had been observed, it had been made out—by the careful following up of quite a different line of research—that human teeth do not come down to take their places in sockets ready prepared for them, but that the alveolar processes consist of bone plastered around the roots of the teeth wheresoever these may chance to arrive; and that, whatever may be the factors which serve to direct the course of an erupting tooth, the alveolar bone plays the smallest possible share in it.

THE SUCCESSION OF TEETH.

The teeth of man and of the mammals are changed but once, and though the details of this change have been studied with great minute-

ness and with marked success, there are, nevertheless, several points which may be illustrated to great advantage by the succession of the teeth in those creatures which have an endless number of new teeth displacing each other.

It is perfectly true that the more precise our knowledge of physiology becomes, the more we find it to be established that the processes at work within the organism are similar to and identical with those at work outside it; but we are very far from knowing all that goes on in a living creature, and it is very easy to push this matter too far (as, indeed, some not unfriendly American criticisms have, on several occasions, accused me of doing), and to attribute all that we can see to forces too wide and too simple to hold sole sway within a living organism.

For example, in default of a better explanation it is very commonly imagined that a tooth is "cut" by being pushed upward through a gradual elongation of its root. It is quite possible to disprove this, without going to the lower animals for our evidence. Thus, the distance through which the crown travels is much greater than can be accounted for by the elongation of its roots. But the readiest demonstration of its falsity is to be found in the dentition of the snake.

The enormous dilatation which the snake's mouth undergoes in swallowing prey, and the liability to breakage and entanglement of the long, slender, renewed teeth, would seem to call for some special position in the arrangement of the successional teeth. Accordingly, these are arranged along the inner side of the jaw, lying prone and parallel to the bone, in such a position as to be tolerably protected from injury, although covered in by the loose mucous membrane.

The youngest of the teeth lies lowest and farthest from the margin of the jaw, and there are generally from five to eight successional teeth of different ages destined to succeed to each single tooth.

Now, the manner in which these teeth move up is instructive. It has already been ascertained that they are laid upon their sides, parallel with the length of the jaw-bone, and as they increase in size they move upwards, but still retain the prone position; that is to say, they move sideways, in a direction in which *motion could certainly not be effected by additions to their own length*.

When an individual tooth has attained to considerable size, and stands next in order to succeed that which is already in use, it becomes erected, and moves up to the level of the working-teeth.

Therefore, an individual tooth in the course of its development moves through a distance three or four times its own length, part of the way sideways; and finally becomes erect and moves on into place, at a time when its full length has already been attained.

All this takes place in obedience to some law of growth, which works through no visible mechanism that I have been able to discover; for

there are no specialized structures in the snake's jaw to which we could attribute the moving and the guidance of the tooth-sacs.

Thus much for the manner in which the teeth move forward into place. Prior to their doing so, however, the predecessors have to be got rid of.

This is effected by the process of absorption: a process about which we have very little positive knowledge.

We are accustomed to believe—or, if not to believe, to have a sort of indistinct notion—that the absorption of one tooth is pretty closely connected with the near approach of its successor.

But in a large number of reptiles (especially snakes) we see the absorption of the old tooth going on before the new tooth has got very near to it.

It would be more correct to say that, after the lapse of a certain period, a process was set up to remove the organ,—just as we may often, though not invariably, see that temporary teeth, the successors to which are absent, are removed by absorption.

Nevertheless, although absorption may take place when the approaching tooth is some little way off, it is beyond all question that the approximation of a tooth is capable of setting the process in operation.

The common frog affords a very excellent example of the fact that absorption is in no way dependent upon the pressure of the advancing tooth. The lower jaw of a frog closes within the teeth of the upper jaw in such a manner that there is very little room left on the inner side of the teeth for the development of their successors.

Hence it comes about that so soon as a young tooth-germ attains to a very moderate size, it must move outward, and this it does by causing absorption of one side of the base of the older tooth. Into the excavation thus formed moves the ever-enlarging tooth-sac, and finally it passes bodily quite into the pulp-cavity of the older tooth (Fig. 4).

Now, it is to be noted that the young tooth is all the time enveloped in its tooth-sac, and that its outer surface is covered over by the delicate elongated cells of its enamel organ.

Had the young tooth-sac even come into close contact with the side of the older tooth, the cells of its enamel organ must, on that side at least, have been crushed and flattened; but nothing of this sort takes place.

The young tooth-sac moves up to a hard calcified wall,—the side of the older tooth, which melts away before it,—and passes through the gap, without one single delicate cell on its surface being disturbed. It would be difficult to find a more beautiful example of the exact balance maintained between the various processes going on in a developing part: no more of the old tooth is absorbed than is necessary to give passage to the new one, and yet exactly enough is eaten away to let it pass through without the derangement of the most delicate of its parts.

When an absorbing temporary tooth is extracted, a papilliform, highly vascular body of very appreciable size is usually visible beneath it. This so-called absorbent organ, or absorbent papilla, is a comparatively large thing, but only a very small part of it is really essential to the process.

Where absorption of the teeth of a frog or a crocodile is going on with the very utmost rapidity, the younger tooth-sac is so close upon its heels that there is no room for more than the very thinnest layer of cells between the advancing tooth-sac and the absorbing edge of the old tooth; and it is very striking to observe how so small and insignificant-looking a tissue is capable of rapidly eating away dense tooth-substance.

I have always felt a difficulty in understanding how absorption could be effected beneath the gum in the roots of a second molar against which a misplaced wisdom-tooth was pushing; for it seemed as though there could be no room for the absorbent organ to interpose itself. These observations do not explain away the difficulty, but they seem to make it less.

In the case of the frog, or, still better, the crocodile, we may see what becomes of the pulp of an old deciduous tooth when it is attacked by absorption from below. It is a familiar fact to all of us, that the pulp of a temporary tooth under such circumstances does not die and decompose, although it loses nearly all sensibility. Still, I do not know that its exact condition has ever been carefully described.

The crocodile and the frog, with their endless succession of teeth, each one of which crowds upon and enters the pulp-chamber of its predecessor, are excellently adapted for our observation of these changes.

The old pulp retains its former bulk; it does not shrink nor liquefy; but a great number of its vessels become choked and occupied by coagula, and its nerves cease to be recognizable (they are, at no time, so numerous nor so conspicuous as in a mammalian tooth-pulp). The outer layer of odontoblast cells disappears, and, in short, the whole pulp becomes transformed into a mass of finely-fibrillated connective tissue. The change is gradual; the pulp, as its day of usefulness goes by, becomes more and more degenerated, till at last it is transformed into one of the most indifferent tissues of the body.

Such are a few of the facts in comparative odontology upon which I have chanced to stumble while pursuing another object of investigation which seemed to illustrate facts in human odontology.

I feel that I owe some apology to the New York Odontological Society for venturing to place before them so fragmentary a paper; one, moreover, which I have not found the leisure even to put into such language as I could have wished. My excuse is, that I was asked to send some short contribution, and that I have done so amidst the press

of much other literary work, which has absorbed all the scant leisure of a busy practitioner; and I hope that, out of the material which I have cast down in a chaotic heap before you, there may be enough that is intelligible to furnish suggestions for thought and a basis for a discussion which I would it were my privilege to hear.

Discussion.

Dr. Peirce. The paper from the pen of Prof. Tomes, of London, just read by the secretary, should be one of great interest to every dental student, for it is impossible to thoroughly appreciate the peculiar adaptation and beauty displayed in the development, structural arrangement, and density of the human teeth without some knowledge of those of the subordinate orders of animals. The proper study for mankind is not man alone, but man and his antecedents; to study the former only would be like taking the first term of a great series, and neglecting all the other terms, which would necessarily lead to a one-sided and inaccurate view of the order of things. The appropriate drawings accompanying the paper, and now before us, beautifully illustrate the typical form of a tooth as developed in man and the other vertebrates. A cone or combination of cones is the type, with the base of the cone in the necks of such teeth as are perfected in a short space of time, and destined to last through the life of the animal with but once renewing, such as those of the carnivorous and omnivorous animals, while those that are being constantly renewed when injured by wear or lost by violence have the base of the cone situated deep in the jaw, as have also the incisors of the rodents, which are constantly growing from the base to supply the loss from the cutting edge.

Another lesson we learn from Owen's "Odontography" in this branch of comparative anatomy is one in behalf of the general law of unity of organization. The great whales, before they acquire their peculiar array of baleen plates, manifest in their earlier age a transitory condition, a true dental system, which, though abortive and functionless, beautifully typifies that which is normal and persistent in the majority of the order mammalia.

These small teeth entirely disappear at or before birth, yet here is exemplified the earlier stage of dental development in the higher mammals to which they belong. Beyond this stage the true dentition of the baleenide does not advance.

In this way they manifest their closest relations to the typical characteristics of their order at this early period of development, but as they advance towards maturity, they divest themselves of part of the more general type, in order to assume their special and distinctive characteristics.

Dr. McQuillen. The subject of Mr. Tomes's paper is a most inter-

esting one. The proper way to acquire knowledge of the human organism is by study of comparative anatomy. Such representations as we have there (referring to chart on blackboard) and the paper that has been presented to-night, illustrate the fact that Mr. Tomes is a worker; that in place of perusing books he uses his eyes and other senses in original investigation, and these things show the results of his careful observation.

It is much easier, of course, to watch the changes taking place in reptiles and fishes than in mammals; but at the same time, to arrive at a correct apprehension of the changes taking place in the development of the teeth, it requires that there shall be a more thorough and perfect study in that direction than has heretofore been made. In respect to the opinions advanced by Mr. Tomes relating to the absorption of the hard tissues, or of the absorption of the deciduous teeth by the structure underneath, I must say that I cannot accept these views. I shall have to take exception to that theory. He does not claim, however, to have originated the theory that the soft matter found under the deciduous teeth absorbs those organs. We know that the tooth has been built up cell by cell, cementum and dentine; and that by a retrograde metamorphosis the same tissues that have been built up cell by cell are gradually absorbed and wasted. But I cannot understand how one tissue can absorb another.

When speaking of fibrin, I neglected to direct attention to the fact that the presence of fibrin and albumen in the blood is denied by some physiologists, and substances named *plasmine* and *serine* are recognized in place of them. When blood is drawn from the vessels the plasmin and serine undergo decomposition, and form fibrin and not albumen.

Adjourned.

(To be continued.)

THE MISSOURI STATE DENTAL ASSOCIATION.

THE Missouri State Dental Association will hold its twelfth annual meeting in Temperance Hall, Sedalia, Missouri, commencing Tuesday, the 6th of June, 1876, at ten o'clock A.M.

The Executive Committee desires to state that the clinics will be made a special feature at this meeting, and to this end they have secured the names of some of the best operators in the State, who will be present and demonstrate their peculiar mode of operating. They would respectfully urge a full attendance of the members. A cordial invitation is extended to all in the profession.

W. H. EAMES, *Recording Secretary.*

CONNECTICUT VALLEY DENTAL SOCIETY.

THE semi-annual meeting of the Connecticut Valley Dental Society, for 1876, will be held in Stedman Hall, No. 3 Pratt St., Hartford, Connecticut, on Tuesday and Wednesday, June 13th and 14th, commencing at two P.M. on Tuesday. A general invitation is cordially extended to all members of the profession to be present at this meeting.

C. T. STOCKWELL, *Secretary*.

PENNSYLVANIA STATE DENTAL SOCIETY.

THE eighth annual meeting of the Pennsylvania State Dental Society will be held at the Pennsylvania Dental College, Philadelphia, commencing Wednesday, July 26th, at ten o'clock A.M., to continue in session three days.

The programme will embrace essays and discussions, surgical and operative clinics, and a microscopic exhibition.

A full announcement of the order of exercises will be made in the July number of the DENTAL COSMOS.

R. HUEY, *Chairman Exec. Com.*

BALTIMORE DENTAL SOCIETY.

AT a meeting of the Baltimore Dental Society the following officers were elected:

President.—Dr. C. T. Brockett, of Maryland.

Vice-President.—Dr. M. W. Foster, of Maryland.

Recording Secretary.—Dr. F. F. Drew, of Maryland.

Reporting Secretary.—Dr. E. P. Keech, of Maryland.

Treasurer.—Dr. Charles E. Duck, of Maryland.

F. F. DREW, *Recording Secretary*.

NEW JERSEY STATE DENTAL SOCIETY.

THE sixth annual meeting of the New Jersey State Dental Society will convene at Atlantic City the second Tuesday in July, at ten A.M., and continue in session three days. A cordial invitation to meet with us is extended to the dental profession generally.

CHARLES A. MEEKER, *Secretary*.

MASSACHUSETTS DENTAL SOCIETY.

THE semi-annual meeting of the Massachusetts Dental Society will be held at Martha's Vineyard on Wednesday and Thursday, June 28th and 29th, 1876.

GEORGE F. GRANT, *Recording Secretary*.

INDIANA STATE DENTAL SOCIETY.

THE eighteenth annual meeting of this society will be held at Indianapolis, on Tuesday, June 27th, 1876, at ten o'clock A.M., continuing its sessions during three days. All dentists not members of the society are most cordially invited to be present and participate in the discussions. The meeting will be one of unusual interest.

J. R. CLAYTON, *Secretary*.

CALIFORNIA STATE DENTAL ASSOCIATION.

THE seventh annual session of the California State Dental Association will convene in San Francisco, Tuesday, June 13th, at ten o'clock A.M., and will continue four days.

A most cordial invitation is extended to every worthy member of the profession to be present on that occasion, and all so desiring, if possessing the necessary qualifications, will be as cordially admitted into active membership.

H. J. PLOMTEAUX, *President*.

KENTUCKY STATE DENTAL SOCIETY.

THE annual meeting of the Kentucky State Dental Society will be held in Louisville, on Tuesday, June 6th, 1876. It is very desirable that the profession of the State be well represented, and the profession outside of the State have a cordial invitation.

A. O. RAWLS, *Secretary*.

EDITORIAL.

CONSERVATIVE DENTISTRY.

A TENDENCY to conservatism in medicine and surgery has been a distinguishing characteristic of the last three decades. The surgeon is no longer ambitious, as formerly, to be distinguished by his brilliant operations; and to designate a practitioner of surgery as bold or heroic would not nowadays be considered complimentary. On the contrary, the reputation of the surgeon depends upon the intelligence, care, and skill with which he labors to preserve and restore members and functions which, previous to the time alluded to, would have been sacrificed to his personal ambition in the use of the knife.

A like conservative change in sentiment is exemplified in medical

practice. Diseases are treated less heroically than formerly; the ambition of the physician being to learn how to conduct his cases without adding new dangers to the patient by the treatment.

Not more marked, however, is the change in the practice of medicine and surgery than is the contrast between the practice of dentistry at the present day and that of a quarter of a century ago.

To preserve the integrity of the physical organism and of the vital forces, and to restore diseased or wounded members, whenever possible, may, therefore, be said to be alike the leading principle of surgery, of medicine, and of dentistry.

The improvements in results which have grown out of this conservatism in theory and practice it would be idle to rehearse; but the lessons of encouragement to renewed effort should not be lost. We have not yet arrived at perfection. The improvements shown by a comparison of the present with the past are, we believe, destined to be outdone in the future, and to an extent which it would now seem folly to predict.

There are still many and interesting points connected with dental pathology which are, at best, very imperfectly understood; the contradictory experiences regarding which are doubtless largely owing to limited or incorrect observation. A more intelligent comprehension of pathological conditions, their remote causes and natural tendencies, would, it may be inferred, result in the ability to modify their course and retard their progress. To attain such results, however, there is necessity that observation should be exact and comprehensive, the theory on which the observer starts out serving only as a basis for observation and to be laid aside when a fresh fact demonstrates its falsity. Opinions thus arrived at would have a value to which those based on mere empirical practice can never be entitled.

AN ACT TO REGULATE THE PRACTICE OF DENTISTRY IN THE STATE OF PENNSYLVANIA.

AFTER considerable effort and many delays, the bill to regulate the practice of dentistry in Pennsylvania has received the signature of the Governor and become a law, in operation from the date thereof. We give the full text of the bill as passed:

AN ACT to regulate the practice of dentistry and to protect the people against empiricism in relation thereto, in the State of Pennsylvania, and providing penalties for the violation of the same.

SECTION 1. *Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, That from and after the passage of this act, it shall be unlawful for any person except regularly authorized physicians and surgeons to engage in the*

practice of dentistry in the State of Pennsylvania, unless said person has graduated and received a diploma from the faculty of a reputable institution where this specialty is taught and chartered under the authority of some one of the United States, or of a foreign government, acknowledged as such, or shall have obtained a certificate from a board of examiners, duly appointed and authorized by the provisions of this act to issue such certificate.

SEC. 2. That the board of examiners shall consist of six practitioners of dentistry, who are of acknowledged ability in the profession. Said board shall be elected by the Pennsylvania State Dental Society at their next annual meeting, as follows: Two shall be elected for one year, two for two years, and two for three years, and each year thereafter two shall be elected to serve for three years, or until their successors are elected. The said board shall have power to fill all vacancies for unexpired terms, and they shall be responsible to said State Dental Society for their acts.

SEC. 3. That it shall be the duty of this board:

First. To meet annually at the time and place of meeting of the Pennsylvania State Dental Society, and at such other time and place as the said board shall agree upon, to conduct the examination of applicants. They shall also meet for the same purpose at the call of any four members of said board, at such time and place as may be designated. Thirty days' notice must be given of the meetings by advertising in at least three periodicals, one of them being a dental journal, and all published within this State.

Second. To grant a certificate of ability to practice dentistry, which certificate shall be signed by said board and stamped with a suitable seal, to all applicants who undergo a satisfactory examination, and who receive at least four affirmative votes.

Third. To keep a book in which shall be registered the names and the qualifications of such, as far as practicable, of all persons who have been granted certificates of ability to practice dentistry under the provisions of this act.

SEC. 4. That the book so kept shall be a book of record, and a transcript from it, certified to by the officer who has it in keeping, with the seal of said board of examiners, shall be evidence in any court of this State.

SEC. 5. That four members of this board shall constitute a quorum for the transaction of business; and should a quorum not be present on any day appointed for their meeting, those present may adjourn from day to day until a quorum is present.

SEC. 6. That any person who shall in violation of this act practice dentistry in the State of Pennsylvania, shall be liable to indictment in the court of quarter sessions of the proper county; and, on conviction, shall be fined not less than fifty, or more than two hundred dollars. *Provided,* That any person so convicted shall not be entitled to any fee for services rendered; and if a fee shall have been paid, the patient, or his or her heirs, may recover the same as debts of like amount are now recoverable by law.

SEC. 7. That all fines collected shall inure to the poor fund of the county in which the prosecution occurs.

SEC. 8. That nothing in this act shall apply to persons who shall have been engaged in the continuous practice of dentistry in this State

for three years or over, at the time of or prior to the passage of this act.

SEC. 9. That, to provide a fund to carry out the provisions of the third section of this act, it shall be the duty of the said board of examiners to collect from those who receive the certificate to practice dentistry the sum of thirty (\$30) dollars each, of which sum, if there be any remaining after liquidating necessary expenses, the balance shall be paid into the treasury of the said Pennsylvania State Dental Society, to be kept as a fund for the more perfect carrying out of the provisions of this act.

Signed April 17th, 1876.

JNO. F. HARTRANFT,
Governor of Pennsylvania.

M. S. QUAY, *Secretary.*

PERSONAL.

Dr. W. ST. GEORGE ELLIOTT, who was for six years in Yokohama, Japan, has located at 63 West Fifty-fourth Street, New York.

OBITUARY.

SOLYMAN BROWN.

SOLYMAN BROWN, A.M., M.D., D.D., D.D.S., was born in Litchfield, Connecticut, on November 17th, 1790, and died at the residence of his son-in-law, Judge Tathill, on the 13th of February, 1876, at Dodge Center, Minnesota, at the advanced age of eighty-six. At the age of eighteen he entered Yale College, and graduated in 1812.

About the year 1823 he embraced the doctrines of the New Jerusalem Church, and became a minister of that denomination, and at the time of his death was the oldest living minister of that church in the United States. Dr. Brown possessed a superior mind; he was a polished gentleman, a finished scholar, a writer of ability, both in prose and poetry, and the author of many published works. He entered the ranks of the dental profession about 1830, and took a prominent part in the elevation of dentistry. The first recorded meeting of dentists was held at his home in Park Place, New York, when the American Society of Dental Surgeons was organized, and the foundation laid for the first dental college and first dental journal.

Dr. Brown was managing editor and publisher of the *American Journal of Dental Science* during its first years of issue in New York City.

PERISCOPE.

THE AWAKENING IN DENTISTRY.—It is with great pleasure that we announce the effort made by our *confrères* on both sides of the Atlantic to awake from the state of lethargy in which they appear to have been plunged during the past ten years. It is with joy that we see them prepare themselves to take their part courageously in the struggle for the realization of reforms which shall place the surgeon-dentist in the position to which he has a right, the attainment of which we all await with so much ardor. Unfortunately, if we appear all to be awakened at the same time to the sentiment of the necessity of reforms, immediate and radical, we have not also the same unanimity in action. No: after the example of the personages in the fairy tale, whom a magical power kept asleep during a prolonged period, we are all awakened in the position which we held before; some near the goal, others (and, alas! it is necessary to range among the last those who practice in France) not having yet quitted the point of departure. A progressive movement is everywhere commenced among us; we have shaken off our inertia, and we have put ourselves *en route*, slowly, it is true, but with the certitude of arriving; such, at least, is our hope. In America the members of the Odontological Society of New York protest energetically against the three crying abuses which are obstacles to the progress of the profession in that country, and which are:

1st. The too special character of the instruction received by the dental students; they not being required to furnish any proof of medical or classical knowledge.

2d. The examination of the students by their own professors; a system which entails the sad consequences of favoritism.

3d. The short duration of the term of study; the apprenticeship of a vulgar craft appearing by comparison to require more time than that of our profession.

Our *confrères* in England are not satisfied either. They demand—

1st. The legal recognition of the rights of surgeon-dentists having diplomas.

2d. The registration of every dentist.

3d. The exclusion from the list of all practitioners who shall not be licensed dental surgeons, to date from 1876. This last demand constitutes in our opinion only a half-measure, and we refer those of our readers who understand English to the admirable article written by Mr. Cartwright on this subject (Mr. Cartwright demands the full medical diploma). The need of reform is making itself felt in Austria, in Switzerland, in Holland, in Belgium; and we have room to hope that before long the dentists throughout the whole civilized universe will coalesce to obtain from their respective governments the legitimate acknowledgement of their legal rights, invoking in support of their demands the position which they occupy in the medical profession, of which they are far from being the least useful members. But if we wish to succeed we must brave not only our avowed enemies the charlatans, but above all our indifferent and timid friends; bearing in mind the saying of the general who dreaded more the faint-heartedness of a single one of his own soldiers, than the valor of twenty of the camp of the enemy. Those who have at heart the welfare of the profession have

already waited too long; kept back by lukewarm friends, they have let pass weeks, months, and years, and to-day things are at the same point where they were ten years ago. At present that we have decided to shake off our torpor, let us guard ourselves from half-measures. As for us, we shall not attempt to open a new discussion on the opportuneness of demanding in future from all dentists the title of doctor in medicine. We should fear to be accused of cowardice (finding ourselves in the position of a man who makes use of a chassepot to defend himself against the pop-gun of a child), in essaying to crush the brave Monsieur Bon, and those who in their blindness, and following his example, discuss with old arguments a question settled years since for all sensible men. We confine ourselves, then, to the following observations:

1st. Is it not strange to see (since the doctorate in medicine appears to some so useless) all the eminent dentists—Tomes, Harris, Salter, Bell, McQuillen, Coleman, Bogue, Moffatt, Atkinson, Taft, Delabarre, Andrieu, Magitot, and so many others whom we might name—possessing, or having possessed during their lifetime, the diploma of medicine?

2d. We have been attached during a long time to dental colleges, as well in England as in America, and yet it has never been given to us to encounter a phenix capable of learning anatomy, physiology, pathology, etc., in the space of two years (referring to the letter of a correspondent, Mr. Bon). All that recalls the history of the fox who, having lost his tail, demanded of his brethren to disembarass themselves of this useless ornament. An affair of jealousy—that's all. Mr. Bon will not do us the injury to believe that we wish to attack him personally; if we have chosen his letter among the mass of those which have been addressed to us, it is simply because it has seemed to us the most moderate and the most reasonable.

In conclusion, at the moment of entering on a new year we think it good to publish the programme which the editor of this journal intends to follow; it is contained in six excellent words, which we borrow from Dr. Garretson: "Universality in education, specialism in practice." We demand for the dentist of the future the best possible education.

1st. Solid classical instruction. (Diploma of Bachelor of Arts.)

2d. Thorough apprenticeship in the laboratory.

3d. The necessary exercise in the practice of the operations within the domain of the specialty. (Diploma of Doctor in Dental Surgery.)

4th. Good medical instruction. (Diploma of Doctor in Medicine.)

We are ready to admit that the acquisition of all this learning demands of the young men who are desirous of possessing it to labor by night and by day; but our device is this, "What has been done may yet be done."

No one has a more difficult task to accomplish than the dentist; it is good that the future generation should be trained for the work. Let those of feeble heart and who are frightened by the perspective of a laborious life abandon the same from to day.—*Editorial in Le Progrès Dentaire—Translated for the DENTAL COSMOS by W. C. Horne, D.D.S.*

THE DISCOVERER OF ANÆSTHESIA.—In a paper read before the members of the Washtenaw County Medical Society, Michigan, "On the History of Anæsthesia," Dr. Edward S. Dunster, Professor of Obstetrics in the University of Michigan, reviews the pretensions of the

various claimants to the honor of being the discoverer of anæsthesia. The conclusions at which he has arrived are as follows: 1st. Numerous suggestions and efforts have been made in times past for rendering persons insensible to pain under surgical procedure. All such suggestions, however, were without practical result, and all such efforts were abandoned previous to the year 1844. 2d. On December 11th, 1844, Dr. Horace Wells, a dentist, of Hartford, Conn., first employed nitrous oxide for the purpose of extracting teeth without pain. Repetitions of the experiment, both by himself and others, conclusively established anæsthesia by nitrous oxide. 3d. Dr. Wells communicated his ideas to a number of professional men in Boston, among them Drs. Morton and Jackson,—the former a previous pupil and partner of his own. A single attempt which was made by Wells in public to demonstrate the power of nitrous oxide to produce insensibility to pain, failed in consequence of too soon suspending the inhalation of the gas. Wells was hissed from the room, and pronounced by some to be an impostor. 4th. In consequence of this unsuccess, Wells was disheartened, and for a brief time suspended further experiments; but he did not, as has been asserted by some, abandon his project, but continued, whenever he was engaged in professional work, to employ nitrous oxide, and in Hartford it became an established practice. 5th. The vapor of sulphuric ether was first employed by Dr. Morton, of Boston, on September 30th, 1846, in the extraction of a tooth, and a few days later in surgical practice, and its use became general in the United States and in Europe, both in medicine and surgery, within a few months subsequently. 6th. That Dr. Charles T. Jackson, also of Boston, disputed with Morton the credit of the originality of this discovery, and it would appear that the first use of ether by Morton was made with the advice and encouragement of Dr. Jackson, if not altogether by his suggestion. 7th. That in November, 1847, the anæsthetic effects of chloroform were discovered in Edinburgh by Dr. James Y. Simpson, the suggestion of its use having been made to him by Mr. Waldie, of Liverpool, and that with comparatively limited exceptions it rapidly superseded the use of ether, as ether had already superseded nitrous oxide. 8th. That subsequently other means and agents of inducing anæsthesia have been sought and found. None of them, however, have acquired any large prominence; one only—the bichloride of methylene—which was first used by Dr. B. W. Richardson, having been employed to any extent or with any reasonable success in practice. These conclusions agree in the main with those of the late Dr. Bennett, of Edinburgh. Dr. Dunster takes exception to the inscription on the monument erected to the memory of Dr. Morton in Mount Auburn Cemetery, and which accords him all the honor as the inventor of anæsthesia, and says that when the story of anæsthesia shall have been fully and finally written, the verdict will be rendered in favor of Dr. Horace Wells, the obscure dentist, whose memory has been neglected, and whose name has been almost forgotten. Dr. Dunster appears not to have come across the evidence which we published in our issue of May 29th, 1875, and which established the fact that the first person who administered chloroform anæsthetically (in the form known as chloric ether) was Michael Cudmore Furnell, now Surgeon-Major of the Madras Army, who suggested its use to Sir W. Lawrence and Mr. Holmes Coote at St. Bartholomew's Hospital, some months before Simpson's experiments.—*Medical Times and Gazette*.

THE HISTORY OF MODERN ANÆSTHESIA.—Dr. Henry J. Bigelow, Professor of Surgery in Harvard University, has recently drawn up a statement of the occurrences connected with the history of modern anæsthesia, in the early scenes of which he played an important part as an eye-witness and actor. Dr. Bigelow's communication forms part of an article in the last number of *Hays's American Journal of the Medical Sciences*, entitled "A Century of American Medicine." We may dismiss all previous attempts in the same direction (although it is well to remember how surprisingly far previous knowledge of anæsthesia had extended), and say that the discovery of ether-anæsthesia in October, 1846, embraced the three essential requisites of being, under proper guidance, a practicable, safe, and efficient method of inducing insensibility, and the claimants to the discovery are three—Dr. Wells, Dr. Jackson, and Dr. Morton. A *fac-simile* of a letter dated October 20th, 1846, of the first-named in reply to one from Dr. Morton, in which the latter announces to his friend the great discovery he had made, is given in Dr. Bigelow's paper, by which it may be clearly inferred that Wells had not at that date made such a discovery himself. And, after a very impartial review of the controversy as between Jackson and Morton, Dr. Bigelow adheres to the accuracy and justice of the opinion he expressed in January, 1848, in favor of Dr. Morton being the discoverer of ether-anæsthesia, after a discriminating and critical examination of all the evidence that had been adduced.

It is significant, however, that Wells, Jackson, and Morton were all in contact at some period of their anæsthetic experiences, of which they showed in some degree a common knowledge, and their fate was linked together in the sad ending that attended the three. Wells returned home from Europe in March, 1847, and asserted his claim to the whole discovery until the idea dominated his reason and embittered his life, and he died suddenly at New York after extraordinary acts, which led even to his arrest; Jackson, it is to be feared, is at the present time hopelessly bereft of reason; and Morton succumbed to apoplexy, induced, it is said, by a publication on behalf of Jackson, of a nature to prejudice a subscription then arranged in New York for his benefit.—*The Lancet*.

THE SOCIETY OF SURGEONS PRACTICING DENTAL SURGERY.—The following resolutions were passed at the recent meeting: 1. That the new society be called the Association of Surgeons Practicing Dental Surgery; 2. That it is founded to promote objects not contemplated by any existing dental society; 3. That the chief of its objects shall be: *a*. The establishment of an improved code of ethics; *b*. The endeavor to encourage a higher educational standard, both general and professional, for those who may hereafter practice the special branch of dental surgery; *c*. The furtherance of modes of practice compatible only with the highest professional status. The following officers have been elected: *Chairman*—Samuel Cartwright, F.R.C.S.; *Vice-Chairman*—S. J. Salter, M.B., F.R.S. *Council*—H. Craigie, M.R.C.S.; T. Edgewell, M.R.C.S., L.R.C.P.; W. D. Napier, M.R.C.S. *Treasurer*—A. Coleman, F.R.C.S., L.R.C.P. *Honorary Secretary*—S. Hamilton Cartwright, M.R.C.S.—*British Medical Journal*.

THE NEW DENTAL ORGANIZATION.—* * * I can only say that the new association has the highest interests of the dental profession at

heart, its objects being to improve the status of the specialty which it represents by every means in its power, and to impress upon all those who practice it the great advantage of becoming fully qualified members of the medical profession; for liberal education and a high standard of qualification are more effective in elevating the position of a profession than any amount of legislative interference.—*S. Hamilton Cartwright, in The Lancet.*

SWALLOWING ARTIFICIAL TEETH.—A few days since I was called to assist a lady, who had during sleep swallowed a rather clumsily-made plate with one tooth attached. It measured about one inch by three-quarters, and was composed of vulcanite, with several sharp, projecting points where it was attached to the other teeth. Unfortunately, I had not a single instrument at hand, having left all in town. The plate was not to be seen or felt under the finger, and it appeared to me the best course was to give an emetic of mustard-and-water, which I did, but with very little effect. The symptoms of dyspnoea increasing, I began to think it advisable to take her to a hospital, when the celebrated case of Brunel came to my relief. I immediately adopted it, or at any rate partially so. I placed my patient flat on her stomach on a low couch, with the head and neck hanging down as low as possible. I then directed her to put her index-finger in the throat as low down as possible, to cause retching; and, having placed a basin on the floor, after using the means above mentioned for a few minutes, the plate was felt by the patient to be moving in the throat, and to our great satisfaction it fell into the basin. I think the Brunel case was a half-sovereign in the larynx, caught in play. It is instructive, and ought not to be forgotten, especially by the younger members of the profession.—*William Faulkner, in The Lancet.*

TOOTHACHE.—I have for a long time very frequently been successful in giving patients relief by stopping the hollow tooth by a paste made in the palm of the hand, by dropping on to a good pinch of the bicarbonate of soda as much tincture of opium or of the vinum opii as the soda will take up, working the whole into a paste, and putting into the tooth.—*Dr. W. B. Holderness, in The Practitioner.*

A NEW MUCILAGE.—The *Journal de Pharmacie* states that if to a strong solution of gum arabic, measuring $8\frac{1}{2}$ fluidounces, a solution of 30 grains sulphate of aluminum dissolved in two-thirds of an ounce of water be added, a very strong mucilage is formed, capable of fastening wood together, or of mending porcelain or glass.—*Scientific American.*

HINTS AND QUERIES.

THE writer would be very glad if some one would give general rules for the treatment of hemorrhages encountered in operations about the mouth, and the principles underlying the conditions and the treatment indicated.—*A. D. L.*

WILL some one who knows inform me of any method by which the useless pieces of perforated rubber dam may be restored to their impervious state? It seems to me to be a sin to be compelled to waste so much material simply because a part of it is rendered useless by perforation.—*F. F. D.*

CAN such a thing be possible as condensing gold in a cavity too much?—P. G.

REPLY TO F., who asks that "some one well qualified will give the manner of applying rubber dam in the various cases occurring in practice, and oblige those who have never seen it used."

No doubt there are others who are better "qualified" to give the information asked for, and who have better methods than the following; but lest they should be too modest to "speak out" I will give you mine, and hope there may be some improvement suggested in reply.

Until within the past year I regarded the services of an assistant indispensable in very many cases arising in the application of the rubber dam. But, having been practicing alone during that time, stern necessity has made me "master of the situation," so far as its application is practical at all; and cases in which it is not are very rare.

Cut your dam into squares of about seven inches. A piece this size will apply to the third molars and extend beyond the borders of the mouth in all directions.

To perforate the rubber, use a piece of pivot wood, or other hard wood, about four inches in length, tapered and round, so that the end used be about one-tenth of an inch in diameter. Select the point for the perforation with reference to the tooth to be operated upon, so that when applied the dam will extend in all directions beyond the lips; rest the stick in a perpendicular position on the bracket with the prepared end uppermost, place the point to be perforated in the dam on the end of the stick, pass one hand down over the rubber, stretching it over the end of the stick, taking care not to force it through; then with a sharp knife give it a slight, quick, drawing cut about half an inch below the end of the stick; the result is a clean, round, smooth hole from the size of a pin to that of a pencil. If the hole be too large, stretch the rubber a little tighter, or cut nearer the end of the stick; if too small, *vice versa*. After a little practice one can cut a hole of any desired size, and much smoother and better than a punch will do it. For molar teeth a hole about the size of the capital O, and for incisors the size of the small o of this type (when the rubber is lax), are about the proper sizes.

If the tooth to be operated on have only a crown cavity, one perforation is all that is necessary; but if it have a proximal cavity, the neighboring tooth next to the cavity will need to be included in the dam, in which event two perforations will be necessary. If the teeth are very close together, make the holes about a quarter of an inch apart; and if there be considerable space between the teeth, leave three-eighths of an inch between the holes. If you have simply a crown cavity to treat, no ligatures are necessary. But for the successful application of the dam to molars and bicuspid the clamps and clamp forceps are *sine qua non*; and having these at hand, take the rubber dam in the left hand and insert the jaws of the clamp through the hole designed for the posterior tooth (where more than one is to be included), with the points of the jaws toward the operator. To do this will necessitate stretching the rubber, and care must be exercised not to lacerate it with the points of the clamp; hold it intact with the left hand, and with the right insert the forceps into the bow of the clamp and close upon the forceps sufficiently to retain the clamp. With the left hand bring the dam in a gathered fold up and back, so that it may be held between the index-finger of the right hand and the forceps, leaving the left hand free to apply to the lip or cheek of the patient; pass the clamp and dam thus secured down or up (as the case may be, with its jaws sufficiently distended to avoid unpleasant grating against the tooth) to the cervix, taking care not to wound the gum unnecessa-

rily. Relax your hold on the dam and remove the forceps; then attach the elastic head-band near the upper corners of the dam, passing it around the patient's head; take hold of the lower part of the dam with the left hand, stretch it forward, and with one of White's right or left burnishers in the right hand pass the dam over the jaws of the clamp, when it will adjust itself around the cervix of the tooth, and up over the proximal edges of the crown, so as to exclude the saliva completely in nearly all cases. When it does not, use a ligature to force the edges between the teeth, as hereafter described. Attach the weights to the lower corners of the dam and the application is complete, provided the operation required is limited to the crown, the buccal, palatine, labial, and lingual surfaces. But in cases of proximal cavities, where two or more teeth have to be incorporated in the dam, after proceeding in the manner above described with the posterior or clamped tooth, with burnishers adjust it on the next tooth, and with a waxed floss-silk ligature, about eight inches in length, held firmly in the fingers of both hands, force the dam between the teeth down (or up, as the case may be) to the gum, pass the end of the ligature, now in the mouth, out and seize it with the other hand, and, taking hold of the slack loop within the mouth either with the fingers or plyers, in like manner force the dam between the tooth and its neighbor on the other side and tie a firm, square knot on the buccal or labial side. It is well to try the spaces between the teeth before applying the dam by passing a ligature between, as it is sometimes necessary to use the file or disk before attempting the application; however, this should be done only on the defective proximal surfaces, where such treatment is proper in the filling of the teeth, otherwise a momentary wedging will accomplish the end desired.

No clamp is required except on the tooth posterior to those which are adjacent to and included in the dam. I seldom use a clamp at all on the superior incisors and cuspidati. With these teeth proceed as follows: After having perforated the dam about an inch from the intended upper edge, suspend it over the patient's mouth by attaching the head-band so that the perforations will come over the proper teeth; then stretch the dam down so that the holes will come at the edges of the teeth, and with a ligature, already in hand, press the portion of dam between the holes up between the teeth; then with another ligature drawn transversely across the tooth to be encircled, and passing across the hole in the dam, by a slight sawing motion force the dam to the right or left, as the case may require, to the space between the teeth; then pass the lower portion of this ligature in similar manner into the space on the other side of the tooth, take both ends in the left hand, holding them taut; with one of the burnishers in the right hand press the ligatures and dam on the palatine side up to the gum and tie on the labial side, and cut the ends near the knot, lest they be in the way while filling. Proceed in like manner with the others.

A similar method will generally serve for the inferior incisors and cuspidati; but occasionally it may be found necessary to use a clamp. With the last-named teeth I do not cut the ends of the ligatures, but tie them together, forming a loop, into which I hang the rubber-dam weights.

Upon the molars and the superior bicuspid the clamp is generally kept during the operation of filling; upon the other teeth, where the clamp is used to facilitate the adjustment of the dam after the ligatures are secure, it is often more convenient to operate with the clamp removed. Seldom more than three sizes of clamps are required in practice, to wit: one for molars, one for bicuspid, cuspid, and large incisors, and a third for inferior incisors.

Should it be found that from some abrupt depression on the surface of a tooth

upon which the dam has been adjusted, or from an accidental puncture of the dam, the saliva is not perfectly excluded, a pledget of spunk or spongoid will generally stop the leak.

Great advantage is obtained in adjusting the dam before preparing the cavities, as the excavations can be made more rapidly in a dry tooth, and sensitive dentine is thereby greatly obtunded. Care should be exercised while using the engine to avoid a rotating bur or drill coming in contact with the dam, as it will often displace it, or so rend it as to require another in its place.

Place a folded napkin on the chin of the patient under the dam so as to absorb any saliva which may flow from the mouth, for it is often the case that a clamp on second or third molar will render it impossible for the patient to swallow.

The rubber dam of medium thickness is best adapted to all cases. As soon as removed from the patient's mouth wash well in clean water and dry quickly; by so doing they may be used several times. Keep the dam in a tight, dark drawer, for under light and exposure it will in time lose its tenacity.

As I am writing for the benefit of those who have never used the dam, perhaps a word in regard to the advantages derived from its use may not be amiss.

The first consideration is the greater perfection of the work done by its aid,—the result of the perfect exclusion of moisture, both from saliva and condensation of the patient's breath,—besides the security which the operator feels from the calamity of a flood upon his work, the freedom of both hands, so that the hand-mallet may be used without an assistant, thereby rendering the use of the bungling automatic no longer a necessity.

Again, the operator may excuse himself from his patient for a few moments to replenish his fire, or relieve the suffering of a patient who may have come in with a painful tooth.

And last, but not least, patients who have had the experience of having the mouth crammed with napkins and bibulous paper, and have been constrained to sit in a torturing position for hours in succession, appreciate the advantages of its use, and say, as Sancho Panza said of sleep, "God bless the man who invented it!" For he may change his position, sit up, or walk about the room without fear of ruining an hour or two's work of your hands and skill.

The only objection I have ever heard raised against it, and that by those just commencing its use, is the time it takes to adjust it. I seldom find a case requiring more than three minutes to apply it to two teeth, and often accomplish it in one, after the dam is punched and all things ready. But should it require fifteen or twenty minutes, *it is time saved* when large gold fillings are to be put in, so much more rapidly and easily can the operation be performed.—*REX, Lincoln, Neb.*

ALVEOLAR NECROSIS.—*Case I.*—In August, 1874, Mr. F. W. called on me to have an operation performed, and gave me the history of his case, as follows:

About two months previous he suffered severely with toothache in the first left inferior molar, and visited a dentist in a neighboring town, who had made an application of arsenic to destroy the nerve. A few days after, he experienced a dull, deep-seated pain in the region of the roots of the tooth. The pain was soon succeeded by swelling, which extended down some distance on the side of the neck, and increased to such an extent that he became frightened and called in his family physician, who lanced the abscess and extracted the tooth, leaving one of the roots. Since that time extreme soreness had continued in the socket, and he had removed the adjoining molar and bicuspid, which had become loose, with his fingers.

The dull pain continuing, and the side of the face seeming as if paralyzed, he again visited the dentist who had made the arsenical application, who now commenced treating with carbolic acid in oil. Obtaining no relief, he applied to a physician in his town, who directed him to me. On examining the mouth, I found that the gum and soft parts had sloughed away, leaving exposed all that portion of the alveoli which had contained the second bicuspid and first and second molars. I could move the dead and discolored mass from side to side with an excavator with very little force. Having passed a lancet around the sequestrum, I lifted it away with a pair of forceps. Finding no more loose bone, I painted the parts freely with iodine, and instructed the patient to call again in a few days; at which time I painted again with iodine, and gave him a disinfectant and detergent mouth-wash, to be used freely during the day. In a short time the place had healed up entirely.

Case II.—A lady who had been badly salivated. Subsequently her mouth healed, and the teeth became firm in their sockets, except on one side, where she had extracted one with her fingers. She suffered continually with headache and dull, heavy pain on the side of her face. On examination, I found that the gum had sloughed off from the right side of the inferior maxilla, extending from the lateral incisor to the first molar, the second bicuspid having been removed. I extracted the first bicuspid and cuspid, and then removed the sequestrum down to the body of the bone. Treatment same as in first case, with entire success.—*A. H. H., Jackson, Miss.*

PARTIAL NECROSIS OF THE SUPERIOR MAXILLA, CAUSED BY AN UNERUPTED BICUSPID.—*Mr. R.*, aged 40 years, of sanguo-bilious temperament, having suffered for two years or more with chronic abscess situated on the right superior maxilla, supposed to have been produced by the roots of a molar tooth, called at the office to have a temporary tooth extracted for his daughter, after which he asked me to examine his mouth, and tell him what caused the abscess. The appearance of the affected side was as follows: All the teeth were in position, except the second and third molar teeth and the second bicuspid, which latter, he said, had never been extracted. The first molar occupied the position of the second bicuspid, close against the first bicuspid. Immediately behind the first molar was a ragged-edged abscess, discharging fetid pus freely. The right side of the face was very much swollen, the swelling extending above the eye; pains excruciating, particularly at night, sometimes worse than at others. On probing, I found it to be the missing bicuspid, lying crosswise immediately beneath the floor of the antrum, causing necrosis of the bone surrounding it. He very reluctantly gave his consent for me to extract it. Taking a pair of duck's-bill forceps,—first dissecting the gum sufficiently to prevent any laceration,—I cut away the diseased bone until I struck the tooth; then taking a firm hold, I removed it from its place, and showed it to my astonished patient, who was much gratified at my success, leaving the office wondering how it was that "that tooth never was erupted."—*WM. A. MILLS, D.D.S.*

A REMARKABLE CASE.—A lady, about forty years old, single, stout built, has lost several upper teeth and some of the lower molars, and has worn a gold plate for many years, with a front and side tooth attached (upper). On the right side the clasp partially surrounds the first molar, though scarcely touching it. The first and second molars, and the first molar on left side above, are in place. Her mouth has been well cared for; gums healthy; the lower teeth have tartar on them.

The inner roots of the three molars mentioned are naked of gums and alveolus to near their points, and enormously cementosed from point to enamel; exostosis distinctly marked; all the other roots also are very much exostosed for some distance up. The teeth are quite firm, with no apparent disease about them, only a little tartar at border of gums, no decay, and some of the other teeth are in a similar condition, only less so. She was not aware of any such growth of cement. I have never seen a similar case before in my practice. My friend, Dr. Turner, of this city, showed me a tooth he had extracted with all three of the roots extensively exostosed, revealing the entire surrounding alveolus, which came away with the tooth, and no discoverable line of demarkation in the *anchylosis*. The tooth decayed. These are the most remarkable teeth I have ever seen.—S. P. CUTLER, M.D., D.D.S., *Memphis, Tennessee*.

HOW TO WORK CELLULOID.—We all agree that celluloid makes, when properly manipulated, a beautiful and durable base—far superior to any other cheap base.

Of the several modes and apparatuses used, some one *must* be the best. In my judgment, Heindsmann's heater is superior to any other which has been offered to the profession. Its construction and the advantages it possesses can be learned from the advertising pages of the DENTAL COSMOS.

My method of procedure is as follows: Before moulding I immerse the blank in spirits of camphor, and allow it to remain twenty minutes. I fill the lamp with alcohol, and draw up the wick three-quarters of an inch, so as to have the thermometer register 300° in about three-quarters of an hour; then close the flask and reduce the flame, letting the mercury run down to 200°, and hold it at that for one hour longer. The material begins to soften at about 180°, when I begin to turn down the screw, allowing time after each turn for the plate to adjust itself. The moulding should be completed before too much of the camphor is driven off. If those who use celluloid will follow the above directions, they will have no misfits or broken plates to report.

The Heindsmann heater possesses several advantages over any other in the market,—strong, simple, not liable to get out of order. Another great advantage it has over any other apparatus is, that you can see how the work is progressing without interfering with it; the door opening at the side, exposing the flask to view, can be opened and closed without allowing the heat to escape. I do not moisten the plaster in the bottom of the flask with water. I like absolutely dry heat; it hardens the moulds, and secures a better adaptation. The plaster is sufficient to secure a uniform heat in the flask.—JOHN R. WATSON, *Whiteley, Pa.*

PAIN OBTUNDER.—In the May number of the DENTAL COSMOS is an advertisement of the Dental Pain Obtunder, in which my name is used without any warrant from me. Several years ago a bottle of the above mixture was sent to me by Mr. Melcher (who represented himself as a physician and late surgeon in the army), for me to experiment with and report the result to him. He further stated Dr. Allport had requested him to send it to me. Supposing the affair to be genuine, and not a quack effort, I made a reply to his note, containing the language quoted in the advertisement, followed immediately by the words, "I trust you will make public the formula." It gives me regret to have been imposed upon. He also calls me "Professor," which I never was. I conclude by stating that further experience with the "Pain Obtunder" has proven it to be *very unreliable*.—LOUIS JACK.

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, JULY, 1876.

No. 7.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 286.)

DURING the instrumentation of a cavity of decay which is at all likely to contain an almost-exposed pulp, it is important constantly to bear in mind from the beginning the liability of giving pain, even during the preliminary exploration.

Remove gently the contents of the cavity, and always syringe with *tepid* water, if syringing is indicated.

Constant thoughtfulness is needed for this; it is not sufficient that the water be made warm once, for it soon cools, but the necessity for a pleasant temperature should never be forgotten.

It should also be remembered that the water which is usually remaining in the syringe should be ejected, and the syringe refilled completely before its contents are thrown into the cavity.

Negligence of this seemingly trivial precaution is frequently the cause of needless irritation and needless suffering.

The *direction of the jet* should also be considered, for the mechanical irritation of a stream of tepid water against the comparatively unprotected pulp is sufficient to cause pain; it should therefore always be thrown into the cavity obliquely, against those portions of the walls which have been already recognized as safe from this danger, and even then without unnecessary violence.

After these preliminaries have been performed, the cavity should be gently dried with either muslin (old, worn and thin) or bibulous paper.

Cotton wool is not advisable for this purpose, because of the fibers,

which are apt to be left adherent to the walls and edges of the cavity, and also from its want of absorbing capability; and agaric (spunk) is not so good as either of the articles recommended, from the fact that the moisture which is to be removed is the means of dissolving the nitrate of potash which is generally used in the preparation of the article, it being steeped in a solution of this salt, and which, dissolving, is productive of decided cold.

After drying the cavity, the means employed for making the final diagnosis are four in number.

1st. *Visual test.*—This is made by direct observation, or by reflection, with a mouth-mirror, which should be warmed by allowing the glass to rest for a moment flat upon the tongue, or by dipping it into warm water, or by holding it, with care, over the flame of a spirit lamp, or by placing it in the receptacle made for this purpose on the side of the “warm water cup.”

When, however, any of the three latter methods are employed, and particularly the last, the heat of the metal about the mirror should always be tested by the fingers of the operator before its introduction into the mouth, as it is liable to become warmer than is agreeable.

The facility for visual examination is increased by having a magnifying glass, if necessary, for direct observation, and a magnifying mouth-mirror for reflection.

The decided difference in color, through all the hues from altered shade of dentine, and varied pink or red, even to dark shades of bluish or brownish, will denote the near approach to the pulp; while the peculiar “orifice” appearance of even a needle-point exposure will require to be seen in but few cases for the insurance of its ready recognition in the future.

When the pulp-cavity has actually been invaded, and secondary dentine has been formed, the result is usually so peculiar in its characteristics, that once seeing is sufficient to impress the memory.

The tolerably well-defined outline of the deposit, the somewhat circular areola which surrounds the spot over the center of repair, and above all the expression of the limpid spot itself, are unmistakable to the practiced eye, and a knowledge of them easy to acquire.



2d. *Pressure test.*—This is made by making pressure in the cavity with a pellet of cotton wool, and the decision as to whether the tenderness (if any exist upon pressure) is due to sensitive dentine, or to impingement upon the pulp, is dependent upon the fact that if it arises from sensitive dentine, *it ceases immediately upon cessation of pressure*; but if it is caused by pulp-irritation, *the pain continues for a little after the irritant is withdrawn.*

3d. *Thermal test.*—As it sometimes occurs that neither by visual

nor pressure testing can a decision as to the dangerous proximity to, or indeed even the vitality of, a partially devitalized or recently devitalized pulp be satisfactorily determined, it then becomes necessary to employ the well-known power of cold, to decide as to the vitality of the pulp and the liability of its irritation from thermal changes.

Inasmuch as this is a powerful test, it should be used under the guidance of this knowledge, and, therefore, a *jet* of cold water should *never* be indulged in at first for making this test.

Intense pain is sometimes the result of a neglect of this caution, and a *single drop* is frequently found more than sufficiently irritating for obtaining all desired information.

When it is found, by experiment, that this is insufficient, then, and then only, does it become warrantable to try the effect of a continuous stream.

It occasionally happens that quite severe toothache is the result, more or less immediately, of this thermal testing with cold water, and it is therefore suggested, in cases of liability to acute suffering (diagnosed from the temperamental stand-point, or from questioning the patient as to previous susceptibility), that the air-syringe be first employed, and the effect of a moderate draft of cool air be determined.

When a paroxysm of pain supervenes from the employment of either a draft of air, or a drop or a jet of cold water, it may be promptly allayed by the gentle and continuous syringing of warm water about the tooth, and the relief may then be made sufficiently permanent for present requirements by the application of a portion of oil of cloves upon a pellet of cotton, held for a moment in the mouth, that the temperature of the medicament may be raised to that of the body, and then pressed, not too firmly, into the cavity.

4th. *Taxis*.—The touch of the suspected point of approach, or of exposure, and the actual puncturing of the pulp to test its vitality, is the last and most decisive means of diagnosis.

This is done either by direct vision or by the employment of the mouth-mirror, and a small untempered probe is employed for the purpose.

It is small, that delicacy of touch may be insured; and untempered, that it may bent into any desired shape or curve.

It should, of course, be used with exceeding gentleness and caution, as it is the only means by which a degree of mechanical irritation amounting to laceration can be inflicted.

This injury must be regarded as detrimental in the extreme, and as one which, except for the avowed purpose of depleting the pulp (an operation which will be referred to in place), should be carefully avoided.

A *touch* is generally sufficient to produce marked response, and when this is not the case, the absence of it can only be judged as indicative

of a favorable or unfavorable prognosis, from a proper estimate of all contingent circumstances.

Finally, in preparing doubtful cavities, excavate at first in such directions and test at first in such manner as we now *know* will not endanger the pulp, and having done this, proceed with unrelenting caution until the preparation is complete.

THE CAPPING OF PULPS.

The preparation of the cavity having been completed, it then becomes necessary to consider whether, with ordinary precaution, chances are in favor of the effort about to be made for the conservation of the vitality of the pulp, or whether the requirements are such as to render some of the various grades of increased skill indispensable to the obtaining of even a diminished likelihood of success.

If the latter, it then behooves one to decide as to the grade of exertion needed in any individual case.

I propose referring to the various materials which have been suggested for this purpose, together with the methods for their employment, and the advantages claimed for each; but I must here state that my experience more and more inclines me to believe that, with the exception of certain considerations, which I shall point out, those conditions of the patients to which I have already alluded have vastly more to do with the final result than has any peculiarity of manipulation or any peculiar characteristics pertaining to material.

The exceptions with which I desire to qualify this assertion are, beside the universal one already referred to, of *non-conductivity*,

1st. The general advantage of *non-irritating* over irritating applications.

I place this proposition thus, because it is not always the case that an application for capping a pulp is objectionable in consequence of irritating attributes, and it might be that the stimulation to pulp-action resulting from creasote or solution of chloride of zinc would produce exactly the effect desired; but experience has inclined me to the view, that a diagnostic power sufficient to indicate the existence of just such a condition is something unusual.

2d. The occasional advantage of a covering possessing *porosity*.

This quality is peculiarly appropriate, and indeed is frequently essential to success, in cases where the dentine is of loose structure, the pulp in that degree of irritation with which effusion is concomitant, and the nervous impressibility such as to render the mechanical irritation of impeded effusion fatal.

This is a condition comparatively easy of diagnosis, at least, sufficiently so to make the suggestion practically useful.

It is only necessary to regard the general tissue condition of the

patient; the strength of the general circulation; the degree of attenuation of dentinal structure covering the pulp, or the magnitude of the exposure, together with the intensity and length of duration of pulp-irritation.

3d. *The advantage of healing or soothing attributes* in connection with compound or simple applications.

It seems almost needless to dilate upon this point, for, throughout the whole range of almost-exposed pulps, from the strongest to the weakest, from the most unimpressible to the most delicately sensitive, soothing, quieting applications seem most acceptable, and with fewest exceptions to meet the indications.

4th. *Plasticity*.—This quality is one which is rapidly and solidly gaining favor; it has come to be regarded by those most advanced in this line of experimentation as *one of the essentials*; and thus it is that combinations of the old non-conforming, but resisting materials with the conforming, but non-resistant applications are held in high esteem by some experienced and successful operators.

5th. *Resisting capability*.—This attribute is also one which is of great importance, although it cannot be regarded as an essential, for many applications have been productive of very satisfactory results which have not, in the least, possessed this peculiarity.

Notwithstanding this, however, I regard the quality of resistance as very desirable, and its possession, other things being equal, as a strong argument in favor of the employment of such plastic filling materials as harden, after their adaptation, in sufficient degree to permit of the introduction of foil fillings without subjecting the pulp to any pressure.

6th. *Durability*.—I have placed this characteristic as the last, because I regard it as probably the least important.

Pulp-cappings are usually so placed and protected as to leave but little question of their permanency, even though they may be composed of plaster of Paris, paper, or even soft and soluble medicated pastes; and yet, as there remains the possibility of subsequent exposure, either as the result of defective filling or of adjacent confluent decay, it becomes desirable that *durability* should be added to the other requisites.

I have seen so many instances in which the salvation of the pulp has eventually depended upon this attribute of the protective covering, that it has been only after much deliberation that I have placed it so low in the scale; and yet I have finally assigned it this position because of the great number of failures in pulp-conservation where articles possessing this quality, but not others more important, have been employed, and because of the greater number of successes which I have enjoyed in my own practice, and have been pleased to see at the hands of others, in which materials not at all durable in themselves had been used.

Materials for Capping Pulp.

It must not be expected that I shall make a complete list of all the suggestions which have been offered for this purpose during the forty years of investigation in this direction.

I shall mention, with comment, some twenty-five or thirty of them, which I think will amply suffice to instruct in the principles which have governed the various attempts at obtaining this important result.

Beyond these, the applications and combinations of materials already used have multiplied to such extent that some of the very oldest are now beginning to be given again as entirely new.

In the earlier days of pulp protection, and even so recently as only twenty years ago, the ideas of the dental authors seem to have been mainly confined to the protective treatment indicated in such cases as would be liable to give trouble from "hot and cold applications and draughts of cold air" after the introduction of metallic fillings, and the passing notice of the very questionable propriety of attempts at preserving the vitality of absolutely-exposed pulps.

Under such influence, it was but natural that they should expend their ingenuity at first upon *muslin*, *oiled silk*, *court-plaster*, *adhesive plaster*, and *paper*, varied in its forms of note-paper, card-paper, folds of tissue-paper, etc., and these, either dry, or in combination with one or more medicaments.

The old "nerve protector" of *muslin*, dipped in spirits of camphor, and afterwards in "old-fashioned wood creasote," and, still later, used as a covering against thermal changes, and as the vehicle for the conveyance of a thick paste of tannic acid and creasote, by which means the whole appliance was more accurately adjusted to the desired portion of the cavity, and further decay of tooth-bone and irritation of "nerve" greatly prevented, is a matter of my earliest dental recollections, and has been employed, to my knowledge, for, at least, thirty-five years.

(To be continued.)

A REPLY TO DR. CHUPEIN'S REMARKS ON OPERATIVE DENTISTRY.

BY MARSHALL H. WEBB, D.D.S., LANCASTER, PENNSYLVANIA.

In the number of the DENTAL COSMOS for May, 1876, Dr. Theodore F. Chupein, in "Remarks on Operative Dentistry," comments upon several points in my article on "Operative Dentistry," published in the February number of the DENTAL COSMOS for this year, to which comments I desire to reply as kindly as he criticised me.

Dr. Chupein asks, "Is the juxtaposition of gold next to gold superior to enamel next to enamel? or is the tooth rendered in a better condition

after fillings of these kinds (contour) are inserted than when the teeth were intact?" I answer most assuredly they are, for the reason that when the cavity is prepared, filled, and the filling finished, as set forth in the article to which the doctor refers, and the gold only being in contact with gold and the margins of enamel free, this very freedom of the margins of enamel enables the oral fluid (kept in almost constant motion by the action of the tongue, lips, and cheek) to keep these margins quite clean even without the use of the brush, floss silk, and tooth-pick. It is certain that when enamel comes in contact with enamel, disintegration of this enamel does take place, and, as stated in the paper the doctor refers to, "almost invariably at or *about* the point or points of contact." I am equally certain that when gold comes in contact with gold, and the operation has been very thoroughly, skillfully, and artistically performed and the parts finely finished (which is NOT "labor lost"), caries will very rarely recur, and cannot do so, at the point of contact. As to those fillings which are liable to "wear flat" in consequence of "the gomphosis articulation," they must be very imperfect and are not worth taking into consideration. (I think the term "gomphosis" is incorrectly used, but the meaning is apparent nevertheless.)

Philosophy would teach that, no matter what "system" may be followed or how "permanent separations" may be made, such separations will not be *permanent*, excepting where the antagonists prevent the teeth separated from again coming in contact. The teeth may remain separated for a short time, but in the vast majority of cases they will again approximate, and the point of contact will be at or near the necks. I am positive that enamel thus coming in contact with enamel does disintegrate, and that cavities of decay are formed at that part of the tooth despite all that is claimed for "self-cleansing" surfaces, even if Dr. Arthur's special injunction be strictly followed, viz, "*It is essential that they* (the proximate surfaces) *be thoroughly polished;*" and yet Dr. Chupein states that "if permanent separations be made, and the teeth so separated be well polished by the operator, this *scrupulous* cleanliness, so absolutely necessary for the preservation of the teeth by the manner advanced (in the article on 'Operative Dentistry'), *although desirable*, is *not* absolutely necessary for the preservation of the teeth operated on by the permanent artificial separation process advocated by Dr. Arthur." Dr. Arthur plainly states that while the operations he advises "are certainly within the capacity of dentists of very moderate ability," yet, "in order to be effective, this treatment demands the exercise of the nicest care, patient labor, and the subsequent watchfulness of the most rigid character,"—mark, "*watchfulness of the most rigid character.*"

I did not "hold as necessary," for the preservation of teeth operated

upon as I earnestly advised, that "scrupulous cleanliness be rigidly and constantly observed." While I regard cleanliness as desirable in all cases, yet that to which I referred particularly in the article on "Operative Dentistry," when advising the daily use of floss silk or tooth-pick, was the manner of *preventing* disintegration of enamel upon the proximate surfaces of the teeth, commencing the use of these at about the time of, or soon after, their eruption. I stated that disintegration of enamel upon these surfaces "may be prevented by polishing the proximate surfaces of the teeth frequently, and by having the patient pass floss silk or use the tooth-pick daily between them."

Dr. Chupein states that "few, very few," of his patients complain of the "annoyance or pain by the impacting of food in these spaces" (made by "permanent separations") "between the teeth during the act of mastication." While I do not doubt that they do not often complain to *him*, yet I know that if their teeth were again of the original size and form the doctor would not fail to be a happier man, because of the expression of satisfaction which his patients would utter; but many of them now think that such is the best that can be done: hence they *seem* to be satisfied. During the past winter as well as the one previous, while operating in Philadelphia, and at other times in Lancaster, Pennsylvania, I have met with patients whose teeth had been "permanently separated" and the surfaces polished, and all this done, too, by those who are recognized as the best operators; and notwithstanding all this I *know* that many of their patients almost *curse* the operator whenever mastication is attempted, while at the same time those who have made such separations for the patients referred to assert that they "so separate the teeth that no annoyance whatever will be given the patients, and that the separated surfaces will be self-cleansing, and, consequently, free from caries." Many of the patients state *positively* that these separations do not only annoy, but prevent them from properly masticating their food. They do not state this to the operator who has brought about all the trouble complained of, mainly because they fear he will upon some pretext separate the teeth still more, perhaps in the manner Dr. Chupein mentions,—that is, that the "proximate surfaces be so cut that the *point* of the tongue can be easily insinuated over them." It is therefore not only untrue that such separations between the teeth do not annoy the patient nor interfere with mastication, but the assertion that "permanent separations" prevent the recurrence of caries upon the "separated surfaces," which are said to be "self-cleansing," is also false. Food wedges at about the point where the teeth again come in contact (which they almost invariably do); this food becomes putrescent, acid results, decay takes place, and a cavity is formed, and that in a part of the tooth where it is difficult to perform a first-class operation. I have had many such cases, some of the "permanent separa-

tions" having been made only two years ago by those most capable of performing such operations well. A number of these cases have been presented in the mouths of dentists, most of whom are recognized as first-class practitioners. Just here I desire to state a problem for those to solve who, like Dr. Chupein, practice and advocate "permanent separation" of the teeth. During the last four years I have been requested to perform, and have performed, operations for a number of gentlemen who *practice* the "system" of "permanent separations," they knowing full well that I do not, and will not, perform any other than operations where the contour line of the original tooth-structure is fully restored. Now, if "permanent separations" be *right* and contour operations *wrong*, why do not these gentlemen have them in their own mouths? I will go further, and inquire why it is that practitioners do not observe the golden rule.

There are two causes, at least, for not observing this: one is that of incompetency and the other a desire for the possession and accumulation of wealth. The latter cause induces many to commence practice before they are competent, and some of those few who are qualified are thus induced to disregard the golden rule.

"It is well enough," say the opponents of the principle of contour as advocated in the article on "Operative Dentistry" to which Dr. Chupein refers, "to perform such operations for dentists, because they keep their teeth clean, and they are thus preserved." The gentlemen for whom I have operated keep their teeth in proper condition, as might well be expected; but, with very few exceptions, all my patients cleanse their teeth as thoroughly; and why? simply because they know that very great care has been taken to restore them to a proper condition and to make them again clear, bright, and beautiful. The attention given by a patient to the teeth will be in proportion to the care, attention, and skill bestowed upon them by the operator.

A portrait or landscape painter, a sculptor,—any devotee in any department of the fine arts,—is not considered an *artist* unless his productions are *beautiful* as well as useful and durable; neither is one a *first-class* dental operator unless his operations are fine, artistic, and conform in outline and beauty to the organ operated upon, and as well are made not only to preserve the remaining tooth-structure, but also to subserve the purpose of mastication. To all, especially to my fellow young practitioners, I would say,

"To show our simple skill,
That is the true beginning of our end."
Follow the first design with earnest will,
For nature's form doth strength with beauty blend.

And now a word with the doctor in regard to *experience*, which he regards as the "best of all teachers." *First-class operators*—those

who have proven by their *works* (I do not mean merely a display of manipulative ability) that they are qualified to teach—*are the best teachers*. “Experience” means but little,—so many years of which signifying in the majority of instances almost, if not quite, as many years in a “*rut*.” For the encouragement of young practitioners as well as for the statement of another truth, I will say that it is my privilege to know young men, almost without any “experience” whatever, who can far excel the greater number, if not all, of those who boast of having been in practice (far too often *mal-practice*) for quite a number of years. They are thus capable of excelling because they have intellects which are quick to comprehend; by *observation* (not “experience”) they quickly perceived the right, and being thus “armed and panoplied for battle,” they had “a hand bold to execute.” In addition to all this, they were actuated by the proper motives. Dr. Atkinson has well said, “Give me honesty, and I’ll prophesy capacity.”

Dr. Chupein entirely misapprehended my meaning in reference to the use of the matrix. All I stated in this connection was that “the gold should not only be built against every part of the dentinal structure, but should be impacted as perfectly as possible against the margins of enamel; and to accomplish this it is necessary to build the gold against the proximate surface of the adjoining tooth; but if there be a similar cavity in such tooth, or too great a space has been made through separation by pressure, it may *sometimes* be well to adjust a matrix, made of a somewhat smoothly-worn separating-file.” I did not then, and do not now, “*advocate*” the use of a matrix of any kind; indeed, I very rarely make use of one, and when I do, it is in such a case as I mentioned, and then only while inserting a filling in the posterior proximate surface of a bicuspid or molar, as indicated. I would only place the matrix and fix firmly with a wedge against the tooth at or near the neck where the surface is plane or slightly concave, and after filling down along it some distance, until arriving at that point where to continue would interfere with the restoration of the contour of the tooth, remove the matrix and complete, trim up, and finish the filling in the manner described in the February number of the DENTAL COSMOS. The gold impacted against the matrix would certainly require trimming up and finishing, no matter what matrix be used. This portion of the gold, together with the edges of the enamel of the part, can be nicely formed and finished, previous to the removal of the rubber dam, by means of suitable files and emery cloth, so that when completed with pulverized pumice or silex mounted upon linen tape the surface of the gold will be contour to the required extent. At one time I did make use of the matrix very often, and three years ago last July, in an article read before the Pennsylvania State Society, I, also, advocated its use. I was not then in all cases *contour* enough, consequently I did not object

to the space which would remain between the teeth where the matrix had been used throughout the whole operation. My reason for making use of the matrix was not so much because it simplified the filling of cavities upon proximate surfaces, as that it prevented the plugging instrument's passing off into and wounding the adjacent parts. I was then using a Snow & Lewis automatic mallet, so that when pressed upon and thus operated for the impacting of gold the instrument was readily pushed off the edge of the cavity. Since that time I have used the Bonwill electro-magnetic mallet, the operation of which is controlled by the index-finger; and, as the instrument is guided as a pen or pencil, no more pressure being required for the one than the other, the gold can be nicely, perfectly, and rapidly impacted at all points and carried to the outer edge of the cavity, and the surplus trimmed off with the plugging instrument without the least danger of passing into and injuring the surrounding tissues.

Very few practitioners, whether attempting the restoration of the contour of the tooth or not, properly prepare and fill cavities and finish fillings upon the proximate surfaces; the vast majority of operators, and even some of those reputed first-class, fail to remove every part of disintegrated enamel, and also leave that part of the filling at the cervical wall very defective, although such filling may have the *appearance* of having been properly inserted and finished.

Dr. Chupein, failing to note this fact, states that no matter how perfectly such operations are performed, that which primarily caused caries will do so again, and thus the operation will prove a failure. Now, while I do not profess to know all about the formation and action of acids, and galvanic action said to take place through their agency between metals and calcium, I am yet *positive* that failure in dental operations is attributable, in the majority of instances, to another cause than those just referred to, viz.,—the very imperfect manner in which such operations are performed. This I know to be absolutely true, although, among many other things which I have observed, very few even admit that they have failures, and when they do admit this, they attribute the cause to the action of acids, and attach a very great deal of blame to the patient for not keeping the parts clean, the operator utterly failing to perform a *clean* operation for the patient. I am positive of all this, because I have carefully observed the many failures I have had, as well those met with from the hands of others. I have never performed a single operation but that I could see, when it was completed, some point or points where I could do better, had I to perform it again. I have always been fully convinced that the correct principle by which an operator should be guided was to so perform operations as to conform to the contour line of the tooth operated upon, and I have ever endeavored to carry that principle into practice. My failures

have all along been attributable to the imperfect manner in which I performed the operation. Notwithstanding all this, I did not doubt the correctness of the principle, but as I endeavored, from time to time, to become more earnest and faithful in the performance of operations, my convictions were strengthened, and I could plainly see why those few who could properly carry out this principle in their operations practiced, advocated, and defended it. All these observations—all these truths—led me to state what I did in the article on "Operative Dentistry," although I could better illustrate than state the points referred to.*

Dr Chupein's "experience" in relation to the relative durability of "flat" and contour fillings proves nothing, save it be that he was unsuccessful in the attempt at restoration of contour. "Many years ago," when Dr. McQuillen suggested the cutting through the masticating plate of enamel to approach a cavity in the proximate surface, contour operations could not be performed (even by the very few who possessed the requisite ability to perform them) nearly so perfectly as now, when we have the rubber dam, the electro-magnetic mallet, the dental engine, and the many other valuable appliances. I am fully aware of those fine operations performed by Drs. Atkinson, Varney, and a few others, wherein the contour was restored; but what was so well done by these gentlemen then could be more perfectly performed by them now. I have seen many of the operations which they performed, and know that such still remain as fine mementos of their skill. That which was stated in the article on "Operative Dentistry," in reference to the operations performed by Dr. Evans twenty-five years ago, meant just this,—that while such fillings served the purpose he intended (that was, the preservation of the teeth) as well as any ever inserted, yet, had the contour been restored, as the gentlemen just named and a few others have done, instead of making the surface concave, thus making it impossible for the patient to cleanse the surface of the gold, these operations would have been, as stated, "still finer mementos." The teeth would not only have been preserved, but such operations would also have contributed to, rather than detracted from, the clear, bright, and beautiful appearance of these organs. All that has been stated in reference to the operations now under consideration is meant as a compliment to Dr. Evans, and I will further state that I believe if he were now called upon to perform similar operations, he could and would perform them differently and better than he did even then so well. As a progressive operator, he could not do otherwise. The "inference" which Dr.

* In the article on "Operative Dentistry," I avoided all reference to self, directly or indirectly, so far as possible, but in this reply I could not well see how I was to do so.—M H. W.

Chupein has seen fit to draw from my published statement in reference to the case just cited is unwarranted, ungenerous, unjust, and unkind.

My reason for citing the case was to show that, even if other than contour operations were performed as perfectly as these were, yet they are not equal to those wherein the contour has been carefully, skillfully, and artistically restored, for, although the fillings mentioned did preserve the teeth a quarter of a century, and caries did not recur, yet the surface of the gold being concave, and not made full nor nicely finished with the edge of enamel, this surface would become dark, even with all the care which the patient faithfully exercised in regard to them. The surface of the gold could have been finished as it was when the fillings were inserted, but this had been done a number of times during the twenty-five years, the same result following each polishing, notwithstanding the patient's earnest efforts to keep them bright. Had I cut away the surrounding enamel so as to make it conform to the surface of the gold, instead of inserting other fillings and restoring the contour, the teeth would have been disfigured and their appearance marred.

PHASES OF PROFESSIONAL DEVELOPMENT.

BY W. C. HORNE, D.D.S., ROME.

THE rise of dentistry in the United States, as a recognized profession, is recent enough to be within the memory of practitioners still living: its growth has been rapid, its development in keeping with the progressive spirit of the country. Its early advancement was largely due to a few individuals, whose assiduity led them to surpass in their operations the very great number who, as in other callings, are content to follow afar off. The time has not arrived when the roll of honor of all these pioneers may be called. Death has removed many of them, and the ranks which have begun to be thinned must show ere long still many a gap.

Thirty or more years ago New York had attracted by her metropolitan fame and wealth a number of the foremost dentists of the country, of whom some still linger. Philadelphia, Boston, and Baltimore each had its celebrities, while scattered throughout the land were others, the luster of whose abilities shed a greater or lesser halo about them. It is to the labors of such, together with their compeers in Europe (then few in number), that American dentistry owes the beginning of the high consideration which it enjoys at home and abroad. Let us pay the grateful tribute which is their due, content if our works shall also merit the praise of those who come after us.

Dr. Eleazer Parmly lived to see, in his own day, an advancement in the profession of which he was an ornament, such as falls to the lot of few men to witness, leaving an example of the gentler virtues which so endear the professional man to his clients. His career, almost coeval with that of our profession, embraces an epoch of great and varied interest, of which the souvenirs should be carefully gathered and piously preserved. Let us embalm his memory with the spices of his virtues, while with tender hands we draw the veil upon his frailties, with that charity of which we shall all at the last stand greatly in need.

Another of the blessed departed who came in and went out as a father before us, with the light of a true heart beaming in his face, was Dr. George E. Hawes. Gifted with a clear perception of the subjects which occupied the thoughts, and with a full comprehension of the objects which incited the efforts of dental practitioners, with a ready and kindly wit he resolved many a contested point, throwing light upon what was doubtful, and effectually disposing of crudities and absurdities, and that with apt illustration and agreeable humor. How much he was beloved and respected, with what satisfaction and confidence his advice and his decisions were accepted, the interest he took in every movement for the welfare of our profession, I need not detail to those who were the witnesses. He was one of the accomplished men of the old *régime*, of whom some still remain to link our present with their brilliant past.

The labors of that noble man, Chapin A. Harris, whose name should be all the more honored for that he devoted his time and his talents less to the accumulation of wealth than to the development of dentistry into a scientific profession, together with his associates, lifted the practice of dentistry from that obscure empiricism which had largely characterized it into the clear light of scientific inquiry and demonstration, by laying that foundation in the Baltimore Dental College upon which our system of dental education has been built.

So long as the various processes of the dental surgery and laboratory continued to be held as carefully-guarded secrets which might be filched from one by his neighbor, engendering a narrow-minded jealousy of every means and appliance of which one had not the monopoly, so long there could be neither professional character nor standard; and to the disciple of such a school it was enough to be as his master. But the leaven of the new order of things began to work. The aspiration for better instruction, necessary to the attainment of a professional standing, began to imbue the minds of younger practitioners, encouraged by the success of their seniors and incited by the desire of popular approval. The granting of honorary diplomas was doubtless a means of giving popularity to the new enterprise, and was intended

to create a professional *esprit du corps*. The occasion, or the supposed necessity for this policy, has long since passed away: the advantages for instruction in the branches of dental art and science are now so widespread, that a thorough and increasingly expansive course of study should be demanded from the neophytes who henceforth present themselves.

In pursuing the inquiry which frequently recurs, "To what is due the superiority of American Dentists?" acknowledgment must be made of the fertility of the American mind in originating appliances for the perfection of given operations, or combining or improving upon those already known; of the avidity with which new and intricate processes producing approved results are seized on and turned to immediate use by those interested, under the spur of a constant public demand for what is newest and best; and of the freedom of inquiry (running at times far into the realms of speculation) which has characterized some of our best men, added to their liberality in giving freely to their fellows the fruit of months or years of experiment and investigation, and the diffusion, with an almost apostolic spirit, of the light which has shone upon them. A large meed of praise is due to our dental colleges, whose professors have devoted much time and pains to the instruction of those who have sat at their feet. But the instruction afforded by the dental college is necessarily of a preliminary character: the diploma granted in the usual order certifies that the bearer has studied and been examined in a certain curriculum, and is qualified to practice. But excellence in his profession is to be gained by years of intelligent observation and experience, while eminence requires, in addition, a rare combination of faculties and acquirements. While our dental schools are, then, the proper entrance into the course of life designated by the term "Dentist," there is necessary a higher school for the attainment of a larger and more varied knowledge.

The Dental Society is the arena where earnest and studious men may present their theories and their discoveries for discussion and for demonstration: where that which is new and good is sure to find recognition and praise; where what is wrong, bad, or imperfect, will be detected and exposed, and where worth and presumption will each very soon meet its proper distinction and reward. One who is a Sir Oracle to the circle of his local admirers, and comes in all the glory of delegate-ship to the annual reunion at Niagara, or Saratoga, or elsewhere, is soon toned down into a wholesome perception of the smallness of the horizon which his eye has been accustomed to scan, and finds that there are more things in heaven and earth than were dreamed of in his philosophy. He goes home a wiser and a better man; and his brethren of the Mad River Valley, or the Thunder and Lightning Hills, learn, in their turn, that there are other worlds than ours.

To ignore or condemn the visions of an original mind is worse than a blunder. The world is indebted for much of its advancement to its dreamers, who supply the ideals which another order of intelligences works out. Horace Wells demonstrated the practicability of anæsthesia with the protoxide of nitrogen: it remained for others to elaborate the appliances which make it generally available. What seer will call down upon his head the blessings of the race by the discovery and demonstration of a reliable process of inducing the exposed dental pulp to recover itself, or to accept kindly the juxtaposition of some foreign substance which shall not excite its exquisite sensibilities?

It has been due to the demand found to be general, to fragmentary ideas gathered here and there, to the incentive of praise bestowed and rewards gained, that many of our most useful appliances have been engendered and brought to light through the media of dental societies, affording as they do admirable opportunities for keeping *au courant* with the progress or ideas of the day. It is no argument against the value of such associations that they have sometimes been scenes of dispute or disorder; that may have been due to the absence of a clear head and a controlling hand at the helm. Such accidents, unpleasant and pernicious, are capable of being avoided or guarded against. A democratic disdain of rules and regulations has often been seen very seriously to interfere with the decorum and repose necessary to a calm reception and investigation of subjects, whether purely scientific or eminently practical. The declamation of the stump orator, and the wire-pulling of the politician, are not the proper adjuncts of a scientific society, and the natural sequence of their toleration is loss of prestige with those who reprobate such proceedings. This has been fully evinced in the history of some of our dental societies.

WHAT SHALL WE FILL TEETH WITH?

BY HENRY S. CHASE, M.D., ST. LOUIS.

THE author's experiments during the last year have demonstrated that dentos, or tooth-substance, is *positive* to every material that is at present used for filling cavities of decay.

In the electro-potential scale dentos stands first, and gold last; between them are metallic alloys and tin. The two latter often change places on the scale, as they are near together, depending on the chemical condition of the mouth. In most acid conditions alloys stand next to gold; but in neutral saliva, or *tobacco-juice saliva*, tin stands next to gold.

That metal is the safest plug, other conditions being equal, which

stands nearest to dentos on the electro-potential scale. Therefore it behooves the dentist to test the saliva of the patient, and inquire into his or her habits as regards food and drinks. When the habits are such that an acid condition predominates, then tin will be the best preservative. In alkaline or neutral conditions, alloys are better, and gold is *admissible*.

We now know that gold being so much further removed from dentos on the electro-positive scale than any other filling material that we now use, it is thereby the most dangerous one we can plug a tooth with if *preservation* of the latter is the sole motive for the operation. But when beauty is considered, it must often be used, even at a risk of less permanence.

Experiments of the author prove that every plugged tooth is a voltaic battery, in which the *current* is mostly limited to the contact of dentos and the filling. This current destroys the tooth-substance at the *margins* of the cavity in a tight plug, but in a leaky one the action goes on throughout the interior of the cavity at every point where the plug and the dentos are in *contact*.

The best alloys are *safer* than gold in any cavity, but would generally be thought admissible only in the posterior teeth, from considerations of appearance.

Pure tin-foil is safer than gold in any cavity in which it can be properly placed; but as it is very soft, and will not withstand mastication more than three or four years on *grinding* surfaces, its usefulness is thereby circumscribed. Its use must be limited, in a great measure, to back teeth, as its color is no better than that of modern improved alloys, which keep their original color. There is, however, a mode in which I am using gold and tin in the same cavity, which gives the optical effect of gold, and yet has all the effective preservative influence of tin: namely, line the cavity with tin-foil to the thickness of No. 80 leaf; twenty folds of No. 4 or eight folds of No. 10 tin-foil in the ribbon shape; cut it into squares, parallelograms, triangles, etc., and place the pieces next to the dentos as the operation of filling with gold goes on, so that one thickness of tin shall interpose between the gold and tooth-substance.

In this way I make a plug which has the *appearance* of all gold; the thin line of tin next to the dentos not showing, except on close examination.

Small cylinders of tin can also be employed in the same manner in connection with gold cylinders. Gold bears mastication better than tin, and also looks better in the teeth. By placing tin next to the walls in such a thin layer, it is not subject to attrition.

Standing in more harmonious relations to dentos than gold, the latter is made a useful friend instead of an enemy by the connection,

for tin has just as effective a preservative influence thus situated as though the *whole* of the plug was of tin.

Gold is less admissible in imperfectly calcified teeth than in those which are more dense; consequently, children's teeth, whether of first or second dentition, will be better preserved by the use of either tin or metallic alloys, because undeveloped dentos is *more* positive than perfected dentos.

Every *good* operator of much experience has often been chagrined at finding his beautiful gold fillings fail, in two or three years, around the margins of the cavities; the dentos had disintegrated. He has often blamed himself for *defective operations*, when he did not deserve it. More especially has he observed this in the teeth of young persons or of child-bearing women. *Voltaic action did that work in probably every case.* The author's paper on "Oral Electricity," in the June number of the *Missouri Dental Journal*, shows that the voltaic current itself has the *power* to do such work, and is all the time doing it in some mouths.

In the foregoing remarks I have used the word "alloys" in the place of amalgam. "Alloys" is quite as suitable a word, and has not the odor of "mad dog" about it. All the best alloys are composed of tin, silver, gold, platinum, and mercury. Alloys are getting to be very differently prepared from what they formerly were; some of them make water-tight plugs, and keep their original color well in the mouth.

Alloys are poorer conductors of electricity and heat than the *mean* of the conductivities of the metals of which they are composed. That alloy into which tin enters in the greatest proportion is the *best* alloy for tooth-preservation, other conditions being equal. In an alloy we demand plasticity for perfect adaptation, non-leakage from the first, permanence of form, so as to prevent future leakage, quick crystallization, so as to be immediately useful for mastication, non-oxidization, so as to preserve color.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR MEETING, EXTRA SESSION.

(Continued from page 321.)

TUESDAY, December 21st, 1875.

Evening Session.

MEETING called to order at eight P.M., by President Northrop.

The secretary read the following paper, entitled, "The Influence of

Vital Force in Resisting Dental Caries," by M. S. Dean, of Chicago, Illinois:

Caries, or *decay* of the teeth, is, in one sense, a disease; it is a structural change, but not a functional derangement. It obviously cannot be the latter, in teeth that have been deprived of a vital pulp.

The question is, not whether the vital forces, in some cases, by throwing up a calcareous barrier in the dentinal tubes, or by thickening the walls as the decay advances toward the pulp, *indirectly retard* the progress of this structural change; but, Is there a vital force in the enamel and dentinal tissues by which they are enabled to resist, in a measure, the chemical forces with which they are brought in immediate contact?

Before discussing this question, we must settle the existence of a "special vital force;" for upon this depends the previous question.

Quite a large number of the scientists of the present day deny the existence of such a force. Among these is the well-known German chemist and physiologist, Prof. C. G. Lehmann. In his work entitled "Physiological Chemistry," he says, "As soon as physiological chemistry allows a vital force, it resigns all effort to be numbered among exact sciences." Also, "The belief which our predecessors cherished of an actual principle of vitality has passed away with them." In his "Manual of Chemical Physiology," he says, page 229, "It has . . . been proved, by the most careful chemical investigations, that organic bodies are constituted according to the same laws, and their transformations follow the same laws, that prevail in inorganic chemistry. All the differences which have been presented between organic and inorganic bodies are *accidental, relative, and non-essential.*"

That there is a special vital force that presides over living, organic matter, and directs its form and arrangement in the body,—in addition to the chemical and physical forces,—in my mind scarcely admits of a doubt. And, although I do not propose to settle this question, it seems to me that one need be but slightly conversant with the science of biology to arrive at this conclusion from the known *facts that lie upon the surface.*

H. Carlton Bastian, who takes a prominent place in this class, but who bases nearly all his arguments upon the authority of Herbert Spencer, Dr. Bence Jones, and others, contends, in his "Beginnings of Life," that this force is only a "transformed physical force,"—that it belongs to the "correlated series of physical forces." In vol. i., p. 61, he says, "Either such forces must be continually springing into being without a cause, originating themselves, growing out of nothing, which is an absurdity; or else within the human ovum, or that of any other animal, there must be locked up, in this one tiny microscopic cell, the whole of the special vital power which is afterward to diffuse

itself through the body, and which later still is to serve as the guiding principle of the whole man.

"How could the tiny cell retain all this priceless energy? What hydraulic press would be adequate to bring about such concentration, even were it destined to be locked up within walls of adamant, rather than of tender protoplasm?"

"Then, too, we come back to the further difficulty, as to how this original ovum acquired its marvelously-concentrated quatum of vital force.

"The ovum is but a differentiated product, an individual cell arising from the almost infinite subdivision and growth of the pre-existing ovum; and therefore it can only have received an infinitesimal share of the original vital force with which its parent germ was endowed.

"This parent germ is similarly related to its progenitor; and so we might run back through the races, and through the ages, did not the very idea carry absurdity in its face. A force independent of the correlated series of physical forces, and yet capable of perpetual existence, with apparently undiminished powers, in spite of an almost infinite number of divisions and subdivisions,—surely there are few who will believe that such a force can exist. The doctrine is absolutely inconceivable,—it cannot be realized in thought."

It is, indeed, inconceivable, as Bastian has said, that one tiny cell should contain this concentrated quatum of vital force; but does the naming this a *physical* force make it less inconceivable? In that case even, what hydraulic press would be adequate to bring about such a concentration of *physical* force within the walls of this tiny cell?

We know, without the aid of much science, that the essence of all this force (call it vital or physical) does reside within a tiny cell; that within the human ovum there is a *force* that directs with unerring precision the particles of matter which enter the organism that forms the man, with all his attributes.

The new being that springs from such a little germ is a *man*, not only in physical appearance, but often possessing even the peculiar features and mental characteristics of the progenitor; in a word, it is the duplicate of its parent.

This could not have been the result of a "fortuitous concurrence of atoms;" for this process of evolution from a single cell has been continually repeating itself, for almost countless ages, with the same unvarying result. The germ of one animal, not to be distinguished from the germ of another, *never, under the most favorable circumstances*, develops into an animal of even a different species. Now, this force (call it what you will) that operates so uniformly in the development of man, from that little speck of matter—a cell—diffuses itself throughout the whole body, and, later in life, serves as the guiding principle of the whole being.

This controlling force must have been *inherited* from a progenitor ; else how does it happen that the offspring is in possession of his individual peculiarities ?

These peculiarities having been transmitted from the father to the son, this directing force must have been *imparted to, and contained in*, the tiny ovum ; for here the influence of the *father*, at least, entirely ceases, and "the infinitesimal share of original force with which the parent germ was endowed" has been sufficient to guide and govern the mass of matter which has entered into the new being in harmony with physical and chemical laws.

The way in which this inherent vital force operates is beyond human comprehension ; but that "organic structures are" *not* "the natural resultants of incident forces acting upon the plastic and modifiable tissues of which they are composed," independent of vital inherited force, must be evident, even from the brief facts above stated.

If we deny the existence of this force because we cannot understand its phenomena, we might with equal reason declare *Life* itself a non-entity. Even Bastian acknowledges that "the most intimate processes of life are utterly inexplicable." Yet, because he fails to comprehend the phenomena of vital force, which cannot be more than "utterly inexplicable," he says, "Surely there are few who will believe that such a force can exist. The doctrine is '*absolutely inconceivable*.' It cannot be realized in thought."

It is not contended by the vitalists that this is the sole cause of the operations of the organism. To use the words of Prof. Morris, "It acts *with* the other forces which act everywhere throughout nature, controlling them in the same sense as magnetism may be said to control the gravity of a piece of iron suspended by a magnet."

I have attempted to show only that nothing is gained by discarding the notion of a special vital force, and accepting in its stead the theory of a transformed physical force ; for thereby we should not advance a single step in science, nor extricate in the least the phenomena attending its operations from the mysterious entanglements with which they are beset.

While I shall, therefore, assume (unless it has already been proven) the existence of a special vital force, yet the question arises, Is this force, in the molecules of the enamel and dentine of the teeth, capable, in the slightest degree, of resisting their natural affinities, or of counteracting in them the external causes of disintegration and decay ?

In the soft tissues this is unquestionably the case. Indeed, there are chemico-physiologists of great repute who believe that there is often a conflict going on between the vital and chemical forces. This idea pervades the writings of the renowned Liebig. He says, under the head "Poisons" (p. 60, "*Animal Chemistry*"):

"The vital force is manifested in the form of resistance, inasmuch as by its presence in the living tissues their elements acquire the power of withstanding the disturbance and change in their form and composition which external agencies tend to produce,—a power which, simply as chemical compounds, they do not possess."

Definition, p. 21.—"Vitality is the power which each organ possesses of constantly reproducing itself. For this it requires a supply of substances which contain the constituent elements of its own substance, and are capable of undergoing transformation."

Contagions and Miasms.—"When a chemical compound of a simple constitution is introduced into the stomach or any other part of the organism, it must exercise a chemical action upon all substances with which it comes in contact; for we know the peculiar character of such a body to be an aptitude and power to enter into combinations and effect decompositions

"The chemical action of such a compound is, of course, opposed by the vital principle. The results produced depend upon the strength of their respective actions. Either an equilibrium of both powers is attained, a change being effected without the destruction of the vital principle, . . . or the acting body yields to the superior force of the vitality, or, lastly, the chemical obtains the ascendancy and acts as a poison."

Here Prof. Liebig unmistakably means that the *living elements* with which the chemical agent comes in contact, by virtue of their vital force, manifest in themselves a degree of resistance which these elements do not possess in inorganic bodies. He does not mean simply that this vital resistance operates *indirectly*, by an effusion of fluids which shield the organic structure mechanically, or by diffusion, or by chemically combining with it, or that they, by some indirect means, thwart or neutralize (in a measure) the destructive energy of the poison, but that the chemical affinities are counteracted or influenced by an overruling vital force.

But the question that interests us mainly, as dentists, is whether the enamel and dentinal tissue can avail themselves of this force when attacked by corrosive external agents.

With a view of testing this matter, I have made a single experiment; and, although I do not consider the result at all conclusive (in fact, I am inclined to believe it is of no real value), yet it may be of sufficient interest to warrant its mention here.

It was with considerable difficulty that I was enabled to procure a proper subject for this experiment, as the person must necessarily undergo the loss of two sound and healthy teeth, besides submitting to considerable pain and inconvenience while the experiment was in progress. The subject finally procured was a boy between fourteen and fifteen years of age.

The teeth experimented upon were the right and left second superior bicuspids, equally well developed and quite free from decay. The conditions of these teeth were as nearly as possible the same, with the exception that one of them had been extracted twenty-four hours before the experiment was commenced and placed in pure water, while the other remained undisturbed in the jaw.

Twenty-four hours after the extraction of the tooth, pits were drilled in the labial surfaces of both teeth, about one-sixteenth of an inch in depth (a little less), and having about the same diameter as depth. These pits were drilled with the same instrument, and great care was taken to have them correspond exactly with each other. These cavities, or pits, were filled with sulphuric acid diluted to three-sixteenths its usual strength, the first application being made twenty-four hours after the extraction of the tooth. The extracted tooth was held in sheet-rubber, with its crown protruding, the inclosed root being immersed in water at a temperature of about 95°. The gums of the tooth in the mouth were protected by the rubber dam and wax.

After three hours of this treatment, the extracted tooth was removed from the bath, lest the acid should become weakened by the osmotic action of the water in the pulp-cavity and the acid in the external cavity. (I neglected to mention that the end of the root was excised and the pulp removed immediately after extraction.) Could not detect any acid in the pulp-cavity.

On this, the first day, continued the acid application five hours. Then dried out the cavities, without washing them, and filled with Hill's stopping. By the action of the acid the cavities were completely filled with a white, chalky substance, but the walls were not softened.

[These teeth had been similarly treated, and apparently similarly affected. If there was any difference, the one in the mouth was acted upon the most.]

Sealed the foramen of the extracted tooth and placed it in water.

Second day. No pain had been experienced during the night from the effect of yesterday's treatment. Acid application continued this day six and a half hours. No pain. Extracted tooth was treated same as yesterday, excepting that the root-canal and pulp-cavity were kept dry. After drying the cavity in the live tooth, it was found somewhat sensitive to the pressure of a pellet of cotton, but not to the touch of an excavator. The cavity seems to have increased diametrically a little more than that of the extracted tooth, and *appears* to *absorb* the acid.

Third day. Applied the acid five and a half hours. Cavity in living tooth increases in diameter more than in depth, when compared with the extracted tooth. Temperature of extracted tooth kept up to about 100° in water, as usual, and the pulp-cavity kept dry.

Fourth day. Subject becoming restive. Made no application.

Fifth day. Acid was applied seven hours. No pain. Cavity in mouth slightly sensitive to pressure with cotton.

Sixth day. Applied the acid, *full strength*, for four and a half hours. When first applied, produced acute pain, which soon ceased. After drying the cavity, the sensitiveness had not increased.

Seventh day. Applied acid, full strength, for three hours. At first, exceedingly painful, which was of short duration.

After this sitting, having applied the acid seven days, with an intermission of one day, the second tooth was extracted. These teeth had been subjected to the action of the diluted acid (three-sixteenths) in all twenty-four hours, and to the undiluted acid seven and a half hours, making a total of thirty-one and a half hours. But it must be borne in mind that these cavities had not been *washed out* from the first application of the acid to the end of the seventh day. They had been only dried out sufficiently to retain Hill's stopping. If we count this time also, the acid action was continued one hundred and sixty-eight hours.

At the close of the seventh day the cavity in the live tooth was found slightly greater in diameter, and that in the dead tooth in depth. The difference in depth, however, was scarcely perceptible.

This detailed history of a single experiment is not given with a view of claiming that I have arrived at any conclusion, or even satisfactory results. I will acknowledge that my object and expectation was to find evidence that the enamel and dentine of the living tooth were acted upon to the same extent as if the pulp had been devitalized; in short, that the tooth-structure possessed *no vital resistance*. The experiment was very difficult to perform, and was by no means satisfactory to myself. Dr. Cushing, whose apartments adjoin mine, witnessed and assisted in the experiment.

I state with some hesitancy that, while drilling into the extracted tooth to form the cavity, I thought I distinctly felt the drill drop into an inter-globular space. I may have been mistaken, but it seemed very perceptible.

Not being skilled in the science of microscopy, I placed these teeth in the hands of Dr. E. D. Swain, who has had much experience with the microscope. He has kindly prepared from them the specimens which accompany this article. They have been closely studied both by himself and Dr. Danforth, a somewhat celebrated microscopist of Chicago. These gentlemen are unable to discover any evidence of vital disturbance that may have been caused by the acid. My object in using *strong* sulphuric acid was to accomplish the destruction of the greatest amount of dentine in the shortest possible time. I am satisfied, however, from experiments made with acids upon the teeth since that time by Dr. Cushing, that a much weaker acid would have com-

bined with the calcareous substance of the tooth much more rapidly. If the weaker acids had been used, and been continued for a sufficient length of time, the appearance of the dentine in the live tooth might have given evidence of vital effort to resist the advance of the destructive agent.

It probably has been noticed in my description of this experiment that I *assumed* that the extracted tooth was *dead*. Although its nutrition and nerval influence had been cut off, and the pulp extirpated for twenty-four hours previous to the commencement of the experiment, yet, without doubt, there was still molecular life in the extracted tooth. For this reason I am *now* convinced that the experiment was of little, if any, value.

Let us now return to the question, Do the enamel and dentinal tissue possess the power of resisting external chemical agents to a greater degree than do the same elements in inorganic substances? I know it is claimed by many that the dentine and (especially) the enamel, being composed almost entirely of inorganic matter, are not subject to the control or influence of the vital forces, after their constituents have been placed in regular form and order in these tissues, and, of course, no longer dependent upon nutrition. That they are less dependent upon a constant supply of nutrient matter than the other organs, and will retain their integrity and usefulness for a longer time after that supply is entirely cut off, will not be disputed. But, notwithstanding the great preponderance of the mineral elements contained in these tissues,* I think there is a very good reason (which I have not yet seen advanced) for believing that they are aided, by vital force, *in a limited degree*, in resisting disintegration and decay. But, *after* the note below, and reasoning from certain facts, Lehmann says, "There would be nothing absurd in the supposition that a portion of the phosphate of lime in the bones is *chemically* combined with the cartilaginous substance," etc.

We know that the living bones, during the growth of the child, are constantly undergoing absorption; while one portion is being built up, another is being removed. This is a physiological process, and the invariable rule in normal nutrition. We know, also, that the roots of the deciduous teeth are always normally removed by this process of absorption. We further know that when molecular death takes place in the bones or in the deciduous teeth, from that moment their absorption is discontinued. I am aware that it is contended by some that necrosed bones may be, and sometimes are, absorbed in the system.

* Lehmann says, "That the phosphates of lime are only mechanically deposited in the bones is obvious, from the circumstance that we can so thoroughly deprive them of all mineral constituents by dilute hydrochloric acid that they leave scarcely the trace of an ash."

But I know of no single well-authenticated case of the kind; while, on the other hand, the cases are numerous in which such bones have remained in the system for years without exhibiting the slightest trace of absorption. The same may also be said of the molecularly dead deciduous teeth.

If these statements are not literally correct, in their broadest sense, it will certainly be conceded that these molecularly dead tissues of the bones and deciduous teeth are not as readily absorbed as if they possessed molecular life. And why are they not? Their texture remains apparently the same; they still yield as readily to the physical and chemical forces; and yet they are invulnerable, as a rule, to the process of absorption as a physiological process. These forces in the living enamel and dentinal tissues must possess some control over the chemical affinities of these molecules; and hence it may not be unreasonable to suppose that they may not only work in harmony *with* the physiological external absorbent forces, in effecting their own disintegration, but also *against* the non-vital agencies that may tend to decompose them. This idea does not conflict with the doctrine of the greatest chemico-physiologist of his age. Liebig, in his work on "Animal Chemistry," part iii., in speaking of vital force, says, "The vital force in a living animal appears as a cause of growth in the mass, and of *resistance* to those external agencies which tend to alter the form, structure, or composition of the substance of the tissue in which the vital energy resides." Again, "The vital force is *manifested* in the *form of resistance*, inasmuch as by its presence in the living tissue their elements acquire the power of withstanding the disturbance which external agencies tend to produce; a power which, simply as chemical compounds, they do not possess."

These quotations are sufficient to show, in unmistakable language, the views of that great scientist upon this point. That the elements of the dentine and enamel possess less of this vital resisting force than do other parts of the living body is highly probable, and that the enamel possesses it in a smaller degree than the dentine would also seem probable. For, the less vitality a tissue possesses, the less would be its vital resistance to the action of chemical agencies.

Confirmatory to this statement, I again quote from Liebig: "As in the case of other forces, the conception of an unequal intensity of the vital force comprehends not only an unequal capacity for growth in the mass, and an unequal power of overcoming chemical resistance, but also an inequality in the amount of that resistance which the parts or constituents of the living tissue oppose to a change in their form and composition, from the action of new external active causes of change," etc.

Gentlemen of the Odontological Society, I am compelled to close this

article thus abruptly. My time has been so thoroughly occupied with other matters which could not be neglected that I have not been able to devote the necessary time to the treatment of this, *to me*, difficult subject. I therefore send this to you with a feeling stronger than can be expressed by the word *reluctance*. I hope this apology will be accepted, and the discourtesy which might be implied in sending such a crude and disjointed essay be pardoned. While the facts and arguments here presented have not been displayed in their clearest and strongest light, many others of equal significance have been entirely omitted which tend to show, very forcibly to my mind, that there is a vital force which presides over the living tissues and which may oppose the action of external agencies. For instance, the differences in the action of *aromatic sulphuric acid* upon necrosed and living parts of bone, as explained by Dr. Atkinson, appear to me to be a very strong argument in favor of this theory.

In conclusion, I do not wish to be understood to claim that vital force can manifest itself independently of the chemical or physical forces; though the latter, of course, may act independently of the former in inorganic matter.

Discussion.

Dr. John Allen, of New York. If there is no one to make any remarks in reference to Dr. Chase's paper, I would like to make a few. In reference to the subject of pressure as a cause of decay of the teeth,—as to its being a primary cause of decay, etc.,—that carries us back to some fundamental principles. Why should these teeth be crowded if the proper principles are observed in developing the maxillary bones and the teeth? Has our Creator made a mistake, and not fixed a law so as to furnish a maxillary arch large enough for the number of teeth that He designed to place there? Now, I think it is not very proper for us to cast such imputations on the Creator. I am under the impression that He was a good architect, and knew how to construct these teeth, with all their twenty-four bones and four hundred and eighty muscles, nerves, arteries, etc. I believe that He placed them there as they should be. Now, although it has been asserted that the six-year-old molars ought not to be there,—that the fault is with the architect,—that there has been a mistake in furnishing these supernumerary teeth,—we must go back to fundamental principles. It is a fact that the arch is not large enough to meet the requirements of those teeth; but shall we, on that account, correct the evil by their removal? I do not subscribe to such a doctrine. It was never intended that they should be removed; if it had been, the same provision would have been made for the absorption of their fangs as is made in the case of the temporary teeth. But no such law exists; consequently, it was never intended that they should be taken out. If there is a fault here, let us

see if we cannot trace it to the whole probable cause,—our own indiscretions,—our wrong acting.

The fact is that we refuse to comply with Nature's laws; we don't adhere to those fundamental principles which we should observe in order to a perfect and complete dental development. We do not find in the animal kingdom such contraction of the jaws that there is not room enough for the teeth. We don't find it in other nations of people who do not change in their food the proportions of the proper constituents of which these bodies are formed.

I recollect seeing a statement in reference to the zoological garden in London, that they attempted to raise young lions. They failed from the fact that the maxillary arches of those young lions never met. They were not large enough to come together; there was no suture, and consequently they could not receive nourishment. These lions were fed upon lean meat, and they did not get a sufficient amount of lime in their food to have these dental arches as they should be. We could build up a beautiful theory in regard to these things if these facts did not stand in our way. The point I have in view is this: that if the jaw—the maxillary arch—is developed sufficiently, there will be room enough for our teeth. To illustrate this allow me to cite to you, not individual cases, but whole nations, in support of the assertion which I have made. The first which I will cite you are the Albanians, who, according to Hippocrates, had well-proportioned mouths and jaws, and beautiful teeth. I cannot say that of modern Americans. The next are the inhabitants of Eastern Africa, who are noted for their beautiful and regular teeth. In their case there is no need for the removal of the six-year-old molars. They do not change the natural proportions of their food as we do. We eliminate the mineral elements and throw them one side, and therefore we don't get the full benefit of our food. If it were not for this improper diet there is no reason why the American nation should not be as well developed as the nations I have cited. These are the historical facts in regard to this subject. The people whom I have cited have no occasion to use tooth-powders or brushes. They don't take one-hundredth part of the pains in cleansing and purifying the teeth that we do, and yet they don't lose one tooth where we, as a nation, lose a million. There is the whole nation of Abyssinia, of whom we have the same historical record in regard to their beautiful and sound teeth, and also in regard to the perfect health and development of their alveolar processes. There are also the Mandingoes, of Central America, of whom we have the same record. I might go on and cite hundreds of other cases. If you will read Pritchard's "Physical History of Man in the Various Nations of the Earth," you will get the facts in regard to this subject, and you will readily trace the necessary connection between health and soundness of the dental organs, and

simple and natural diet. When we bring whole nations as witnesses to this case, I don't know how you are going to refute the argument.

Let us look at a few facts for example. In five hundred pounds of whole grain there is muscle material, seventy-eight pounds; tooth material, eighty-five; fatty material, sixty-five. In five hundred pounds of fine flour,—no matter whether it is oats or wheat or rye,—muscle material, sixty-five; bone and tooth material, thirty. Therefore you see there is a great difference between the flour and the whole grain in regard to the constituents for the nourishment of the dental organs. In refining this flour and making it white, you take out its most essential constituent for the growth and development of the teeth. Bread is the staff of life, and in eliminating from that these vital properties you take from it our principal source of nourishment for the teeth. Now, gentlemen, if we are to look at facts, we cannot impugn the Creator, and charge Him with being partial to other nations by giving them fine teeth to extreme old age and bringing this miserable calamity upon us; I don't believe it. I think that He has done as much for us as for any other nation,—as much as we deserve,—and I don't believe that it would require many generations to restore a perfectly sound condition of things, if we return to natural and proper diet. We find that we have some thirteen or fourteen original organic substances. These are divided into four classes,—albuminoid, proteine, fats, and minerals,—and it was not designed that we should change these natural operations in our food-supply. I think it is our duty, if we would advance the best interests of our profession, to urge upon our patients the importance of using more whole grain, as Nature has provided it with all those constituents.

Dr. Cook, of Brooklyn. The food that was given to those lions in London was not very different from that which was given to the young lions in the Paris Zoological Gardens. In the former case the development was such that they could not close their mouths, and in the other there was a normal and natural development. I would like to know what is the natural food of lions in their wild state,—if it is bran?

Dr. J. Allen. I would inform the gentleman that in Paris, instead of giving the lions beef all the time,—lean meat,—they give them smaller animals in which there are bones and teeth and lime. They procure the smaller animals, such as fowls, rats, dogs, etc. By that means they get a sufficient amount of phosphate of lime and carbonate of lime to enable the jaws to come together; hence the difference. The lion in its native state lives upon the smaller animals, and therefore, in raising them artificially, we should follow Nature as much as possible.

Dr. Cook. The gentleman assumes that the animals at the London Zoological Gardens receive meat without bones.

Dr. Allen. I have seen it so stated.

Dr. Cook. Have you had an opportunity to look into the Zoological Gardens at London?

Dr. Allen. I have looked into the facts as reported.

Dr. Cook. It seems to me it is begging the question to state that the animals are fed simply on lean meat and fat, and not on bones. It is a well-known fact that the animals in our menageries in every case receive bones with the meat.

Dr. Kingsbury. The last two papers strike me as being very important. The paper by Dr. Chase, on pressure and contact as causes of dental decay, I think should lead us to the recognition of a great fact that is apparent to all,—namely, that in our practice this condition of the human denture actually exists; that we have contact and pressure. When God made man, He made him upright, and pronounced His work good. The human organism was perfect in all respects; but man has sought out many inventions; he has fallen from his primeval condition, and, perhaps, from that time down to the present deterioration has been going on in his system. I fully agree with Dr. Allen that we have no right to impugn the Infinite Wisdom in the arrangement of the dental organism. I don't think the Creator placed four more teeth, as a general rule, than the maxillary arch was able to accommodate. I think we should regard all those cases of undue contact and pressure and crowded condition of the denture as abnormal conditions, and attribute them to causes which reach far back into the generations which precede us. The crowded condition of the human denture and the imperfect organism, also the organic structure of the teeth, is attributable, in a great measure, to want of a full degree of vitality or vital force. Man has become deteriorated gradually to such an extent that the organic structure of his organs is not as perfect as at the period anterior to the present. The subject of the treatment of, or best mode of treating, cases of this kind is a subject of great importance. It strikes me that there are comparatively few cases where it is just and advisable for us to sacrifice the large number of four of the teeth.

If I recollect aright, the author of the paper advised sacrifice of the superior second bicuspid or the first molar. I think the time he has mentioned as the proper time for the extraction of these teeth is too early. The early extraction of these teeth would constitute an obstruction to the growth of the maxillary arch. The presence of those teeth is necessary to keep up the supply of pabulum for the proper and natural growth of the jaw. Again, we find that in many cases the growth of the jaw at a period beyond the time he has mentioned is very considerable, so that a subsequent examination of the arch would prove that a mistake had been made in the premature extraction of those teeth. In numerous cases where there is apparently a crowded condition which would indicate the necessity of more space, we find that condition

altered by the growth of the jaw in after-years. Again, I am satisfied that contact and pressure of the teeth upon each other is a normal condition of the teeth; and it is undoubtedly the best condition, provided the teeth are as perfect in their structure as our Creator designed they should be, and as, perhaps, it was in the early history of our race.

When we consider the organic structure of the teeth, and the beautiful arrangement for resisting any pressure and force to which they may be subjected, we should take into consideration the different hard tissues,—the cementum, dentine, and especially the enamel. You know that is so arranged in its substance, in its crystals or rods, that their ends are always in the direction of the force applied to them,—for instance, the enamel prisms on the grinding surface of the teeth are parallel to the long diameter of the teeth, and there is an organic change from the grinding surface around to the lateral surface of the teeth. If we find the enamel-rods are at right angles with the long diameter of the tooth, in that arrangement the structure of the enamel is beautifully adapted to the pressure that it may be subjected to. This arrangement is undoubtedly the result of infinite wisdom and design, that this organic structure, this structural arrangement of the hard tissues, should be adequate to the forces which might be brought to bear upon the teeth in the efforts of mastication.

He speaks of contact and pressure of the teeth being causes of decay. Now, prior to that period when he recommends the extraction of the superior bicuspid or first molars, you know that the jaw and subjacent tissue is soft and yielding, so that the teeth previous to the time recommended for the extraction of those teeth are not pressed hard upon each other laterally, and therefore I don't think it would be then proper to produce anything like necrosis of the hard tissue, and that if any pathological condition of that kind arises in the human teeth it is always in the adult period. I think it arises, not so much from pressure on the lateral surfaces of the teeth, as from want of vitality in the hard tissue to resist those chemical agents that corrode and break down the hard tissue,—enamel and dentine; and then it arises, probably in numerous cases, from osseous fermentations taking place so that the salts of the teeth are dissolved. In this way contact and pressure of the teeth upon each other become secondary or indirect causes of decay, or producing causes, inasmuch as they may be favorable to the retention of food between the teeth. I think if man was placed back amid his normal conditions there would be a decided improvement in the course of one or two generations in regard to his denture. I think the normal condition of man is that of the savage state, so to speak. God created Adam and Eve and turned them loose into the world; but in the course of time man has reached a different plane of existence,

and his mode of living has become changed. He has wandered very much from his original habits and conditions. I think that if more was done to give vitality and force and energy to the whole system we would see, under such circumstances, a very marked improvement in the character of the teeth.

I will offer a remark (if I have not overrun my time) in regard to the next paper, "The Influence of Vital Force in resisting Dental Caries." My own practice and observation have satisfied me that there is a vital force existing in the hard tissue of the teeth through the medium of the dental fibrils which have their apex on the inner surfaces of the enamel, where the enamel-rods rest on the outer surface of the dentine. And in many cases, especially in the early periods of the teeth, these fibrils enter into the substance of the enamel-tissue. There is no doubt that the liability to dental caries is in proportion to the lack of enamel. Vital force our Creator designed should be an important force in the human system. I think it is evident that this vital force presides in the teeth, from the fact that teeth, devitalized or deprived of their nerves, are much more liable to dental caries than teeth that have not been so deprived. Of course we all understand that the vitality of the teeth is derived from the dental membrane as well as through the medium of the dental pulp. When a tooth is deprived of its pulp it is only partially dead, but its vital force is much diminished; and we find invariably, that when teeth have been treated in this way, they are much more liable to the action of chemical agents than teeth that retain their full normal force where the pulp is in a living condition. Such are my observations for many years, and I presume those are your observations. There is no question but that there is a vital influence in living organism that enables it to resist, to a great degree, those agents which tend to corrode, destroy, and break down the organism.

Dr. Riggs, of Hartford. I have listened with a great deal of interest to the papers and discussions that have been presented to the society, content to listen. But the papers that have been read lately, and the discussions thereon, have induced me to make a few remarks. There lived, about eighteen hundred years ago, a philosopher who taught the doctrine, "If thine eye offend thee, pluck it out; it is better to enter into life with one eye rather than having two eyes to be cast into hell-fire." I take it that the wisdom that dictated those words will also teach the doctrine that if you have got a six-year-old molar, broken down to that extent that it cannot be made a useful and healthy structure in the organism, it would be better plucked out and cast away. It is better to enter into life with twenty-eight good, sound teeth than thirty-two broken down, miserable structures. I am one of those who believe that effects follow causes. I am one of those who believe that I cannot sin against my body without the natural physical penalty being visited upon me.

It is so in the physical realm, and so in the spiritual. We have gone on, heretofore, committing all manner of offenses, and thinking that by a few penitential tears we could wipe them out and be restored to our previous condition. What is the use of the forgiveness of a sin unless we are placed back as good as new? I believe that it is impossible to get along in this world at the present day with any other doctrine, except that of compensation for all faults and indiscretions. Our first parents have been referred to by my friend on my right. I for one am much obliged to Mother Eve for eating that forbidden fruit, that we, the offspring, might know good from evil. Better to be as we are than like the beasts of the field. Rather than impugn the Creator with the failings which attach to ourselves, let us charge them home upon ourselves, and we can always trace them to causes originating in our own improper conduct. If we go on in the deterioration that has been growing upon us for years, the result will be many more invalids and sick people in the community than at the present day. Though the average of human life is prolonged, the average of teeth will not be prolonged with the other organs of the body.

Dr. Kingsbury. I hope the gentlemen will not understand me as taking the ground that the teeth are not to be extracted in any instance. I am under the unpleasant conviction that I spoke with a good deal of ambiguity; that I could not express what I wished to; and I have no doubt I said some things I did not intend to say, and left out some things I did intend to say. But I hope you will not understand me as taking the ground that there are not indications in many cases that would justify the extraction of the teeth in order to relieve the crowded condition of the human denture.

Dr. Codman, of Boston. When I was here a year ago, among the subjects discussed was that of the proper development of the jaw, and the theory was advanced that this proper development was due to pressure, and that pressure was more beneficial in the process of development than we are apt to suppose. I think there is no gentleman here who pretends to say that pressure is the primary cause of decay of the teeth. We have too many cases in our practice to disprove that position. We have cases where teeth are all piled up in a heap, sometimes being perfectly healthy and undecayed in such condition. Those cases are, perhaps, exceptional; but they prove that pressure is not, primarily, a cause of decay, although it may be in a secondary sense. It may be an irritating cause. I will not argue whether we should extract teeth as a general rule. That is not a question for me to decide. It is for the individual judgment of the operator. I will speak of certain principles which are paramount in the development of the teeth.

When a child having a bad mouth comes to any of us, we must do the best we can to correct the existing evil; and when we take a

child into our care, we become responsible for that child, and it is our duty to understand the laws governing the development of its teeth. I will illustrate my ideas on the blackboard. (*Dr. Codman here drew on the blackboard a diagram of the under jaw with the temporary molars in place.*)

The second set does not always develop on the same plane as the first; for instance, the new plane of development for either jaw may be higher or lower than the plane of the temporary teeth. But, whatever their plane of development, the sixth-year molar invariably develops in one place,—that is, directly behind, and close to, the second temporary.

It is important at this time to keep the teeth under a natural pressure to insure development of the jaw. I have often seen in healthy, well-developed children, from the age of three years upward, a gradual widening of the space between the front teeth. This is not noticed, as far as I know, in any of the books; but I consider it strictly normal.

In examining the teeth at this age, they often seem to be very much crowded, and the temptation to remove the temporary canines to make room is great; for they often stick out above the plane of occlusion and become loose. But their removal would be a fatal mistake; for then the centrals and laterals would immediately occupy the new space given them, and thus the space which should have been reserved for the coming canine of the new set would be lost, and that tooth would develop outside the lower arch.

What causes the temporary canines to rise above the other teeth? In the progress of development the large, coming teeth lift these little ones from their places, pressing the processes out of place also. They are often caught by the superior canines, which are also pushed out of their places and locked by them,—driven or held in such a position that the incisors are unable to get free. In such a case, shorten the temporary teeth, with a file, incising forceps, or burring engine, to the length of the permanent ones.

Now, why should we preserve, with so much care, these temporary cuspids or canines? Because the two temporary molars and temporary canine, when in place, occupy the same, or a trifle less, space than the three permanent teeth that are coming to take their places. Now, if we have a true development by these means, why are we called upon to sacrifice the sixth-year molars?

The under jaw, exercising the moving force, is the matrix of the upper, and drives the upper teeth into their position,—as, for instance (*illustrating*), if the cusps of the upper and lower teeth interlock exactly, like this, they cannot move from their fixed position; and if a file-space is made *exactly* in the center between teeth with this true articulation, they cannot and will not change position; but if a file-space is made on one side or the other of the center, the uneven wear and pressure of

the teeth will force them apart in one direction and together in the other, making those ugly spaces, that catch food so badly.

Dr. Palmer. I can hardly allow the paper by Dr. Dean to pass without a remark upon one point; namely, in regard to the resistance to decay by vital forces. That there is such a resistance to decay we cannot deny. But that there is any internal force set to work to barricade against the invader, I think we *must* deny. In the destruction of the tooth-structure by any agent,—we will say acid,—the first action of the acid is to dissolve the lime-salts in the teeth. In such action, it comes in contact immediately with this vital principle, and there is resistance, because the filling up of the pores tends to exclude it. It is very much like cutting down a tree in the forest and building up a fire against the stump, and building a fire against a tree which has not been cut down. In the first case combustion will take place readily, as there is not the resistance of the vital forces that there is in the latter case. And this constitutes the difference between the vital and devitalized teeth in their resistance to external influences. It is just the difference which exists between granulated sugar and candy, so far as resisting solution is concerned. I care not how this external action is stopped; if you reduce to a certain extent the surface, and cut off that surface which is covered over with cartilage, you stop the action of the agent and retard the process. If, however, the tooth has been devitalized, and the lime-salts have been carried away by the retreating vital principles, you have left the tooth in its original form, as before it was calcified.

Dr. Bogue read the next paper, entitled, "The Practical Results Obtained with Plastic Fillings, as Compared with Theoretical Tests,* by Thomas Fletcher, M.C.S., Warrington, England.

* * * * *

Adjourned.

AMERICAN DENTAL ASSOCIATION.

THE sixteenth annual session of the American Dental Association will be held at Philadelphia, Tuesday, August 1st, 1876, in the Methodist Chapel, at the corner of Broad and Arch Streets, and continue in session four days. Clinics will be given during the session of the association in the Philadelphia Dental College and the Pennsylvania College of Dental Surgery. Ample accommodations can be procured at reasonable rates, from \$8 to \$15 per week being charged for private board and lodging, and \$3.50 to \$5.00 per day at the hotels.

J. H. MCQUILLEN, *Corresponding Secretary.*

* We regret that the pressure on our space will not permit the reproduction of this paper.—ED. DENTAL COSMOS.

THE AMERICAN DENTAL CONVENTION.

THE twenty-second annual meeting of the American Dental Convention will be held at Philadelphia, commencing on Tuesday, August 8th, at 10 A.M. The opening session will be held in Trinity M. E. Church Lecture-Room, Eighth above Race Street; the remaining sessions at the Pennsylvania Dental College, Tenth Street, below Arch.

The profession are manifesting a decided interest in this organization, and the hope is entertained that it will renew its former vigor.

The committee have made arrangements for the exhibition of dental materials and appliances, and for clinical operations during the session.

Dentists and others desirous of exhibiting instruments, materials, and improvements in any department of dentistry are invited to present them as early as possible, and to notify the committee of their intention.

Essays by leading dentists have been promised; many of more than usual interest. Clinics have been promised by the following gentlemen:

Prof. E. P. Keech, Prof. R. B. Winder, Dr. G. A. Mills, Dr. C. E. Duck, of Baltimore; Dr. Hurlbut, of Massachusetts; Dr. R. B. Donaldson, of Washington, D. C.; Dr. Riggs, of Hartford, Connecticut ("Riggs's disease"); Dr. Atkinson, of New York; Dr. McDonald, of Pennsylvania; Dr. E. T. Darby, Dr. J. L. Eisenbrey, Dr. Ambler Tees ("Electric mallet"), Dr. E. R. Pettit ("Bastett motor"), of Philadelphia; Dr. John Allen, of New York; Dr. D. F. Drake, of Boston.

The profession are cordially invited to be present and participate.

For Executive Committee,

{ E. H. NEALL,
H. TOWNSEND.

ONTARIO DENTAL SOCIETY.

THE Ontario Dental Society will meet on Tuesday, July 18th, 1876, at 2 P.M., in Toronto. All dentists who can make it convenient to be present will be cordially welcomed. M. E. SNIDER, *President*.

KANSAS STATE DENTAL ASSOCIATION.

AT the fifth annual meeting of the Kansas State Dental Association, held at Atchison, May 2d, 1876, the following officers were elected for the ensuing year:

President.—Dr. J. D. Patterson, Lawrence.

First Vice-President.—Dr. J. K. Stark, Kansas City, Mo.

Second Vice-President.—Dr. J. A. Young, Emporia.

Secretary.—Dr. William H. Shulze, Atchison.

Treasurer.—Dr. L. C. Wasson, Ottawa.

Member Board of Censors.—Dr. A. H. Thompson, Topeka.

WILLIAM H. SHULZE, *Secretary*.

NEW JERSEY STATE DENTAL ASSOCIATION.—POSTPONEMENT.

IN consequence of the annual meetings of the Pennsylvania and New York State Dental Societies having been fixed for the same time at which the New Jersey State Dental Society was appointed to meet, the latter is postponed one week, and will take place at Atlantic City, July 18th, 1876, and continue in session three days. A cordial invitation to meet with us is extended to the dental profession generally.

CHARLES A. MEEKER, *Secretary*.

FIFTH DISTRICT DENTAL SOCIETY.

AT the annual meeting, held at Rome, New York, June 13th and 14th, 1876, the following officers were elected for the ensuing year :

President.—F. D. Nellis, Syracuse.

Vice-President.—H. W. Tompkins, Clayville.

Secretary.—John S. Marshall, Syracuse.

Correspondent.—A. B. Cowles, Rome.

Treasurer.—George Elliott, Syracuse.

Censors.—Charles Barnes, Syracuse; S. B. Palmer, Syracuse; H. P. Chambers, Lowville.

Delegates to the State Society.—F. D. Nellis, George Elliott.

Delegates to the American Dental Association.—Charles Barnes, H. W. Tompkins.

JOHN S. MARSHALL, *Secretary*.

ODONTOGRAPHIC SOCIETY OF PENNSYLVANIA.

REPORTED BY L. ASHLEY FAUGHT.

THE annual meeting was held on Wednesday evening, May 3d, 1876. The following officers were elected for the ensuing year :

President.—Dr. F. M. Dixon.

First Vice-President.—Dr. M. H. Webb.

Second Vice-President.—Dr. E. T. Darby.

Corresponding Secretary.—Dr. J. H. McQuillen.

Recording Secretary.—Dr. E. L. Hewitt.

Treasurer.—Dr. S. H. Guilford.

Librarian.—Dr. J. L. Eisenbrey.

Curator.—Dr. James Martin.

Exec. Com..—Drs. T. C. Stellwagen, C. A. Kingsbury, R. Huey.

Delegates to the American Dental Association.—Dr. E. H. Neall, Dr. J. L. Eisenbrey, Dr. C. A. Kingsbury, Dr. A. Boice, Dr. James Martin, Dr. W. J. Potter, Dr. F. M. Dixon, Dr. S. H. Guilford, Dr. E. L. Hewitt, Dr. M. L. Long, Dr. C. S. Jones, Dr. Louis Jack.

EDITORIAL.

THE ANNUAL CONVOCATIONS.

By official notices in this number of the DENTAL COSMOS it will be seen that the next annual sessions of the American Dental Association and the American Dental Convention are to be held in this city, the former meeting on Tuesday, August 1st, and the latter on Tuesday, August 8th. The attendance at both of these meetings will doubtless be larger than usual, and it is a reasonable expectation that the proceedings will be of more than ordinary interest. Many members of the profession throughout the country, as well as many foreign dentists desiring to visit the grand Centennial exhibition, have arranged to make their visit to Philadelphia include one or other, or both, of these meetings. Let us hope that the various committees will be prepared to make full and interesting reports, that essayists will have taken more than ordinary pains to present matter worthy of discussion, and that all concerned will be ambitious to make the sessions interesting and profitable.

ETHICS OF JOURNALISM.

WE have neither time nor space to devote to a lengthy discussion with the *Pennsylvania Journal of Dental Science*, nor to answer its irrelevant questions propounded for the purpose of drawing attention from the main question—its appropriation of matter from the pages of the DENTAL COSMOS, without having given credit for the same.

Whether the author of a paper read before a society has the right to offer the said paper to a journal for publication is a matter we are willing should be settled between the society and the author. We have raised no question about it, and do not propose to do so.

It is our desire, however, to provide our readers with all the original matter of interest to the profession which we can legitimately secure. Therefore, when the author of a paper, read or to be read before a dental society, sends us a copy with a request that it be published in the DENTAL COSMOS, the only question to be considered is that of its quality. When any paper is accepted and published it is our invariable custom to give full credit, not only to the writer, but to the society before which it was read, or to the source whence it was obtained.

Regarding the papers read before the Pennsylvania State Dental Society which have appeared in the DENTAL COSMOS, we have only to say that they were obtained legitimately from the authors and without solicitation on our part; illustrated, where necessary, at our own

expense (not at the expense of the society), and published with the full knowledge and consent, if not at the request, of the writers. We are not under the necessity of defending our course in this matter, for the simple reason that it needs no defense; and we point with legitimate satisfaction to the scrupulous care which we have always displayed in the matter of credits.

The *Journal* asserts that all such matter should be "placed in the hands of the Publication Committee and there held secure until after it was published in the form of Transactions," and thinks the editor of the DENTAL COSMOS "should have refused the publication of any paper without the sanction of the CHAIRMAN of that committee"—in this case the said chairman being the editor of the *Pennsylvania Journal*, who *emphasized* his assertion by publishing the papers which had been left in his charge to be "held secure until they appeared in the form of Transactions," and this, too, without credit to the society before which they were read, conveying the impression that they were written specially for the pages of the *Pennsylvania Journal*.

More than this, he copied from the DENTAL COSMOS Dr. Peirce's paper, and called special attention to it editorially as "our leading article," without credit either to the Pennsylvania Society or to the DENTAL COSMOS. The case stands thus: We published, with full credit both to the society and to the writers, certain papers placed at our disposal by the authors thereof. Dr. Welchens, Chairman of the Publication Committee of the State Dental Society, had intrusted to his care certain papers read before the society, to be by him "held secure until after they had appeared in the form of Transactions." These, without even consulting his fellow-members on the committee, he handed over to Dr. Welchens, editor of the *Pennsylvania Journal*, who published them as original communications, without a word of credit to the society or to its Transactions. It were idle to multiply words with a journal which has one set of convictions for its own guidance and a different set for its neighbors. Had the editor of the *Pennsylvania Journal* simply complied with our respectful and proper request that due credit should be given to the DENTAL COSMOS for matter copied from its pages there need have been no controversy. His tergiversations have only placed him in the condition of one of whom it was said, "The last state of that man is worse than the first."

PERSONAL.

DR J. G. VAN MARTER, who has been practicing dentistry at Neuchatel, Switzerland, has located at Florence, Italy. His address is Palazzo Arese, 24, Lung Arno Nuovo.

PERISCOPE.

DENTAL ANÆSTHETICS AND HEART-DISEASE.—A patient who suffers from organic disease of the heart came to me last week and said she was not so well; that she had been a good deal shaken by a prolonged dental operation a few days previously, on which occasion she had eight teeth extracted at one sitting with "the gas," and that there had been some difficulty in bringing her round.

I should say that this patient has had rheumatic fever more than once, and there is a loud, harsh murmur heard all over the præcordia; in brief, she has the physical signs of both aortic and mitral obstruction broadly characterized. Her pulse on Saturday was 144.

I have no intention of assuming, that the prolonged administration of the nitrous oxide and the extraction of the eight teeth at one sitting were wrong in this case, because I have no practical knowledge whatever of the use of this gas, and because I believe the operation and the administration of the anæsthetic were undertaken by persons than whom there are none more capable in London.

But I am anxious, *apropos* of this case, to ask a few questions, and it seems to me to be of considerable interest to every member of our profession that these questions should receive clear and definite answers.

1. Are we or are we not to believe that the existence of great obstruction to the circulation in the form of valvular disease of the heart, such as I have described, counter-indicates—wholly or partially—the use of anæsthetics?

2. If the preceding question be answered in the affirmative with regard to anæsthetics generally, are we to believe that nitrous oxide is in these cases an exception to the general rule?

3. If the existence of cardiac disease is a counter-indication of the use of anæsthetics, do dentists adopt any means of ascertaining whether patients have or have not heart-disease before administering them?

4. If they do adopt any such means, what are they? and are they sufficient?

The patient in question assures me that, although three gentlemen were present, feeling the pulse was the only measure adopted to ascertain the condition of the organs of circulation.

5. If dentists do not adopt any trustworthy measures for ascertaining the existence or non-existence of cardiac disease before administering anæsthetics, ought they not to do so?

I must confess I heard the statement of the patient to whom I have drawn attention with mingled feelings. My first feeling was one of admiration of the nitrous oxide as an anæsthetic. Here was a triumph! A person with a very grave form of heart-disease is kept insensible for a period long enough to extract eight teeth, and is alive to tell the tale! But then I ask myself, Might she not have died? and *then* what would have been said about the administration of the anæsthetic without first ascertaining whether heart-disease did or did not exist?

In connection with this subject, I observe with satisfaction that a society has been formed which is to consist exclusively of qualified medical men who practice dentistry.

As the employment of anæsthetics in dental operations is now so

universal, it is of the greatest importance that those who undertake these operations should not only possess a certain amount of mechanical dexterity, but that they should also have undergone such a training in the principles of medicine and in the diagnosis of disease as shall render them competent to detect the existence of disease in which the production of anæsthesia is unsafe or hazardous. No unqualified person should be permitted to make use of anæsthetic agents, although I am assured on good authority that in much of the advertised "painless dentistry," the administration of "the gas" is intrusted sometimes to the dentist's wife and sometimes to the shop-boy!—*I. Burney Yeo, M.D., in The Lancet.*

DENTAL ANÆSTHETICS AND HEART-DISEASE.—I have read Dr. Burney Yeo's letter on dental anæsthetics in relation to heart-disease with much interest, and feel that he has mooted a question of the greatest importance to the profession and to the public alike. I am convinced that many dangers attendant upon the use of anæsthetics are often overlooked simply because immediate death is not the result of their administration. Considerable experience in the production of anæsthesia by nitrous oxide gas, and the consideration of its action, convince me that in many cases its use is attended with more or less risk, this risk not being sufficiently realized, inasmuch as the mischief wrought is subsequent to, not, apparently, coincident with, the inhalation of the gas. Dr. Yeo asks "whether the existence of great obstruction to the circulation in the form of valvular disease of the heart counter-indicates the use of anæsthetics?" and if so "whether nitrous oxide is an exception to the rule?" To these queries I would answer that in all cases of heart-disease the greatest caution should be exercised, though I do not think that valvular mischief is that condition in which its administration would be attended with the greatest hazard, nor would the mere absence of a murmur by any means necessarily be a proof of safety in its use. The explanation of the phenomena attendant upon the exhibition of nitrous oxide seems to indicate that the conditions of heart which would render anæsthesia by its means the most dangerous are those in which it is the subject of fatty degeneration, or those in which its structure is flabby, and its coats relaxed. In cases of death from this agent the right auricle and right ventricle are much distended with blood, and there seems to be every reason for accepting Dr. George Johnson's explanation of its action—viz., that there is, first of all, obstruction of the systemic, followed by a greater obstruction of the pulmonary, circulation, and subsequent engorgement and dilatation of the right side of the heart.

Some recent experiments made with Dr. G. Johnson upon rabbits have convinced me of the truth of this theory, and, indeed, the phenomena exhibited in a person under the influence of the oxide support it quite as fully—firstly, the pulse is firm and tense; secondly, the pulse becomes imperceptible, and lividity simultaneously occurs.

Without entering into details, it may be briefly said that all symptoms may be explained by extreme contraction of the minute pulmonary arteries, with resulting over-fullness and distention of the right cavities and comparative emptiness of the left, the supply of blood and oxygen to the tissues being greatly diminished. In short, we have all the stages of asphyxia rapidly developed as a result of imperfect oxygenation of the blood.

Assuming these explanations to be correct, it is clear how much danger might attend the frequent administration of the gas in cases like those which I have characterized. About the distention of the right heart there is no doubt, and such a strain upon its parietes when enfeebled would alone be sufficient to accelerate disease, whilst death might be caused by paralysis of that viscus. I have seen one case in which there was intermittence of the heart's action for three weeks after anæsthesia induced by this agent, beyond which there was no sign of disease, the symptoms entirely passing off within the period mentioned.

Other conditions, such as hypertrophied tonsils, short necks in plethoric people, should all be considered in using nitrous oxide gas, especially where there is reason to suspect cardiac mischief. Finally, I believe it offers many advantages when used for short operations, provided that it be administered with caution and skill; but I fully agree with Dr. Yeo that "no unqualified person should be permitted to make use of anæsthetic agents," whilst I would warn those who do so of the consequences they would incur should any fatal accident arise,—if a sense of their moral responsibility be insufficient to deter them from using agents empirically which may be dangerous in the present, but still more so in the future. Medical men could prevent many of the dangers to which Dr. Yeo has alluded by warning their patients of the risk they run in receiving anæsthetics at the hands of those not qualified to administer them. He alludes with satisfaction to the new "Association of Surgeons Practicing Dental Surgery." I trust that it may do much to elevate the status of oral surgery, not only by improving education, but by making all take a higher estimate of the legitimate scope of that specialty.—*S. Hamilton Cartwright, in The Lancet.*

DENTAL ANÆSTHETICS AND HEART-DISEASE.—If you will kindly afford me a small space in your valuable journal, to answer some of the questions asked by Dr. Burney Yeo in your last number, I will endeavor to be as brief as possible. I think it is now allowed by the profession in general that, in those cases in which a capital operation is necessary, the shock to the patient is likely to be attended with more risk than attends the administration of an anæsthetic; hence, for my part, I should not decline to anæsthetize a patient suffering from any organic disease whatever. With reference to the special case mentioned by Dr. Burney Yeo, in which there was great obstruction to the circulation, in the form of valvular disease of the heart, I believe all will allow that any agent which increases that obstruction in itself, or adds to it, by taking away the power of the muscular force of the heart to overcome the obstruction, must have a deleterious effect; and, therefore, in this case, the anæsthetist would do well to avoid using either chloroform or bichloride of methylene, which tend to depress the heart, and select nitrous oxide or ether, which add to the force of the heart's action and stimulate it.

It is well known that the emotion of fear may in itself be fatal in cases, without any cardiac mischief, and therefore, in answer to the second part of the first question, I would say,—before you proceed to the administration of any anæsthetic, endeavor to get the confidence of your patient, and let him feel that he can trust you, then put him *thoroughly and completely* under the influence of the anæsthetic. I

believe there would be some risk if the patient were only partly anæsthetized, for then the system would be cognizant of the unfelt pain of the operation, muscular rigidity take place as a reflex action, and thus, acting by pressure on the blood-vessels, causing greater obstruction to blood-circulation, might produce a fatal result.

In almost all the patients who have given me a history of having been nervous and hysterical after some previous administration of the nitrous oxide, I have almost invariably found either that they have been pondering over and dreading the operation for some days, and passing sleepless nights, or that, just as they have been recovering sensation, one or two teeth have been extracted, and although on awakening they will not remember anything about the operation, yet the unrecognized pain has produced a most intensely vivid and painful dream, the effects of which may have been persistent for days.

I have often given gas to patients in whom a loud cardiac bruit was present, and I have never known any ill consequence follow when the plan I have advocated above has been adopted. At the present time I regard nitrous oxide and ether as by far the safest anæsthetics in use; but I unhesitatingly say that, at some future time, if the practice of allowing them to be given by unqualified and incompetent persons continues, fatal results must be expected.

Having answered that portion of the letter which relates to the anæsthetic part of the question, I leave the remainder to be replied to by those dentists who are in the habit of attempting to do two things well at the same time—viz., administering the anæsthetic and extracting the teeth.—*Woodhouse Braine, F.R.C.S., in The Lancet.*

DENTAL ANÆSTHETICS AND HEART-DISEASE.—I believe that my colleague, Mr. Hamilton Cartwright, has correctly explained the *modus operandi* of nitrous oxide gas and the nature of the risk incurred by a patient who has a fat and flabby heart. With your permission I will add a few words to Mr. Cartwright's account of the phenomena attending the inhalation of the gas.

In most cases, during the first few seconds the pulse and the breathing are quickened, as a result, probably, of emotional excitement. In the next stage the breathing becomes slow and shallow, and the pulse full and firm. Then, after a period which varies in different cases from forty to eighty or ninety seconds, the pulse suddenly becomes almost, or even quite, imperceptible, the features become livid, the pupils are widely dilated, there is a state of general muscular rigidity; in short, all the phenomena of the first stage of an epileptic fit are present. The mouth-piece being removed, the morbid phenomena quickly pass away, the features regain their normal color, the pulse returns, and for a few seconds has again a full and throbbing character.

The explanation of the phenomena appears to be sufficiently obvious. The nitrous oxide rapidly replaces the oxygen in the lungs and in the blood, black unoxygenized blood passes into the systemic arteries and excites, through the vaso-motor nerves and center, contraction of the muscular arterioles. The resistance thus offered to the passage of unærated blood through the terminal arteries explains the temporary fullness and tension of the radial pulse. The unoxygenized blood, passing through the systemic capillaries without the usual interchange of materials between it and the tissues, returns to the lungs in an

abnormal condition, and there excites contraction of the pulmonary muscular arterioles. The resistance thus offered to the passage of blood through the lungs explains, on the one side, the systemic arterial emptiness with feebleness or even complete disappearance of the pulse, and, on the other, the systemic venous fullness with lividity of the skin. The epileptiform condition is explained by the sudden and extreme diminution of the blood-supply to the brain, the blood at the same time being unaerated.

In an animal killed by the continued inhalation of the gas, as I have recently ascertained by experiments on rabbits, performed in conjunction with Mr. Cartwright, the right cavities of the heart and the systemic veins are distended by black blood, while the left cavities and the systemic arteries are comparatively empty and flaccid, the blood on both sides of the heart being equally black. Now, it is evident that if the muscular walls of the right cavities of the heart are thin and flabby or in a state of fatty degeneration, the distention to which they are subjected in the advanced stage of nitrous oxide inhalation may result in a suddenly fatal suspension of their contractile power, or, short of that, in a weakening of their muscular fibers (analogous to the paralysis which results from over-distention of the urinary bladder), which may manifest itself in a feebleness and irregularity of the circulation, continuing for an indefinite period, and attended with many distressing symptoms.

Mr. Braine, in his letter to you, says of nitrous oxide and ether, that they "add to the force of the heart's action, and stimulate it." With regard to nitrous oxide, I believe this to be an error. The temporary fullness and firmness of the pulse may have suggested this erroneous theory; but I have before given what is unquestionably the true explanation of that phenomenon. No one who has studied the phenomena of nitrous oxide anæsthesia can think without a shudder of the reckless administration of the gas by men ignorant of the physiology of the circulation, and wanting the medical knowledge and experience required to detect the physical conditions which in a given case would render the use of this agent more than usually hazardous.

It cannot be too constantly borne in mind by those who administer nitrous oxide gas that the two main sources of risks are—first, an impeded circulation through the lungs, such as may result from advanced vesicular emphysema; and secondly, weakness of the walls of the *right* cavities of the heart.—*George Johnson, in The Lancet.*

DENTAL ANÆSTHETICS AND "DENTAL SURGEONS."—Questions of the highest practical moment relating to the use of anæsthetics in dentistry and to the practice of unqualified dentists have been under discussion in our "Correspondence" columns. Dr. Burney Yeo, impressed by the condition of a patient who had been subjected to a prolonged dental operation under "the gas,"—*i.e.*, nitrous oxide,—proposed certain urgent queries. He inquired whether the presence of strongly marked "physical signs of both aortic and mitral disease," or of valvular obstructions generally, ought not to be regarded as contra-indicating the use of anæsthetics, and if nitrous oxide could be held to form an exception to the rule of caution? Mr. Hamilton Cartwright, Mr. Braine, and Dr. George Johnson have replied, the former pointing out and the latter explaining with singular clearness the fact and causation of great danger attending the administration of nitrous oxide,

particularly in cases of pulmonary obstruction or weakness of the right muscular wall of the heart. The passage in Dr. Johnson's letter, in which he exposes the fallacy of inferring strength from increased fullness and tension of the pulse in the first stage of anæsthesia by nitrous oxide, is of great value and interest. Mr. Braine, as an "anæsthetist," does not attach so much importance to the risk attending the use of anæsthetics. Possibly familiarity with danger breeds contempt. We must confess to feeling more sympathy with the caution of Mr. Cartwright and Dr. George Johnson than with the courage of Mr. Braine. Meanwhile, all our correspondents are agreed in respect to one point, and it is for this we are anxious to bespeak general attention. Nothing short of ignorance of the danger they incur or recklessness can induce unqualified persons to administer anæsthetics of any description, or patients to subject themselves to such perilous because unskilled treatment. It should not be forgotten that a dentist is unqualified, whatever his "experience" or manipulative ability may be, if he is not possessed of the knowledge requisite to diagnose or treat the symptoms of general disease. In a word, he is practically incompetent in all cases in which tooth-symptoms are dependent upon, or have originated in, a morbid condition of the body as a whole, or of the teeth themselves as organs which suffer in sympathy with the general system. No mere manual dexterity can possibly make amends for the lack of medical knowledge. The non-surgical dentist is, of course, wholly incompetent in a case requiring the use of an anæsthetic. He cannot know how to treat his patient; and so generally is this acknowledged that honest men call in the assistance of an expert to take medical charge of the case and administer the pain-relieving drug, while they restrict themselves to performance of the operation. This is obviously a very disjointed and, as far as the public are concerned, most unsatisfactory mode of practice. A question may at any moment arise, either as to the extent of the manipulative process, the condition of the patient, or the administration of the anæsthetic, but no consultation is possible. The qualified surgeon cannot meet the unqualified dentist on grounds of professional equality. Setting all questions of propriety apart, the one does not possess the knowledge necessary to give the basis of any consultation. We think the practical issue raised by this consideration is of vital moment. To speak frankly, we do not hold that qualified medical or surgical practitioners are justified in playing the part of "anæsthetists" to dentists who are teeth-extractors and teeth-makers, but nothing more. Would qualified anæsthetists back up the practice of bone-setters or chiropodists? The one true remedy for the existing state of matters in respect to dentistry is supplied by the "Association of Surgeons Practicing Dental Surgery." The members of this association are first surgeons and then dentists. They are qualified to treat any case of tooth-disease all through. They can trace effects to their causes, they can administer remedies for both root and branch of the malady, and, whatever occurs in the course of the case, they are armed with the knowledge necessary to deal with it; besides which—a point of great importance to the patient—they are in a position to call in and consult with any practitioner whose aid may be desirable. The public will consider their own interests in confiding their cases to such hands, and by so doing secure safety, which cannot be obtained at the hands of men who are "dentists" and noth-

ing more, even when backed up by the occasional assistance of professed "anæsthetists."—*Editorial in The Lancet.*

DEATH FROM CHLOROFORM.—The death of a lady while under the influence of chloroform is reported from Liverpool. Deceased went to a surgeon-dentist on Monday for the purpose of having some teeth extracted. At her own request, chloroform was administered, by the dentist apparently, in the presence of her niece and a servant. The operator had extracted two or three stumps when he observed the lady's face become deadly pale. He at once endeavored to restore animation, and at the same time sent for other medical assistance, but death took place immediately. At the inquest, on Tuesday, the jury returned a verdict to the effect that death arose from misadventure, and they absolved the dentist (who is also a duly qualified surgeon) from all blame.—*Medical Times and Gazette.*

CHLOROFORM AGAIN.—Another death from chloroform at Leicester follows this week close upon the heels of that in Liverpool which we reported in our last. Of course, it is nobody's fault, the case being, as usual, that of a healthy subject submitted to an insignificant operation, and under the influence of a small quantity of the drug. The profession must by this time be well aware that there are in the community a certain number of persons whose peculiarity it is to be fatally sensitive to chloroform, and who will certainly die if submitted to its influence. They must also be aware that there is no means of recognizing the idiosyncrasy except by the actual administration of the drug, and that the death is the first intimation of its existence, and that no precaution on the part of the administrator will suffice to avert the fatality. If surgeons conscientiously appreciate these indisputable facts, we really cannot understand how they can feel themselves justified in submitting patients to a danger which it is impossible to predestinate or to guard against. The pleas which we hear for retaining the use of chloroform may be truthfully interpreted to mean that the saving of an occasional life would be more than compensated by the discomforts of ether, and that, after all, the occasional victim must pay for the conveniences of the surgeon.—*Medical Press.*

THE ASSOCIATION OF SURGEONS PRACTICING DENTAL SURGERY.—I was much pleased on reading in your Journal the two letters signed by "Hospital Physicians," in which opinions were expressed, shared, I am convinced, by the bulk of the medical profession, viz., that every person who practices a branch of the healing art should hold a qualification intimating that he has studied and is competent to practice the whole. Such is the view prominently put forward by the new Association of Surgeons Practicing Dental Surgery; and, whilst I am sure they are most anxious it should be understood that they uphold and encourage all who may practice that branch to take the special diploma in dentistry granted by the College of Surgeons, they consider it should be as an addition to its membership, or, better still when it comes, the qualification of the conjoint examination; and it is a matter of much surprise to me that it should have raised an amount of hostility on the part of those whose position can, I apprehend, be only improved should that view become general. I must admit that the first announcements of the formation of the association, which, however, were quite as unauthoritative as is this letter, were unfortunately

expressed, and unintentionally conveyed a wrong impression of the value entertained by the promoters of the movement in regard to that special diploma.

Why that most excellent and valuable of institutions, the Odontological Society, in which, I am proud to say, I have held almost every office up to its senior vice-presidentship, should have been brought forward as an object to which the new association was opposed, I am at a loss to understand; it only proves how little were the opponents to the association acquainted with the views and feelings which actuated its promoters; as one of whom, I can assert that nothing will be done which may tend to impair its usefulness or impugn its dignity, at least so long as I may be connected with it.—*Alfred Coleman, in British Medical Journal.*

THE CONSERVATIVE TREATMENT OF THE DENTAL PULP.—I will now describe my treatment of a suppurating pulp. This condition ascertained, I first cleanse the carious cavity, removing all trace of decay, and then syringe the suppurating surface of the pulp with carbolyzed warm water, which soon reveals to what extent the pulp has suffered. The next point is, perhaps, the most important that I have to urge, since to its omission may, I believe, be traced the numerous failures which are deplored by all who have earnestly desired to preserve such pulps, but have had to seek refuge in devitalization. This next step is to cut down the surrounding walls of dentine so as to be on a level with the surface of the pulp, which may in all cases be accomplished with suitable sharp spoon excavators, and that invaluable aid, the burring engine, so securing the direct apposition of a temporary carbolic acid dressing. This I have rarely to renew more than twice, at intervals of a few days, governed by the perfection of the previous treatment, and when the tooth does not admit of being stopped at the second interview, I protect the fresh dressing with mastic. The suppurating surface having been changed to a healthy one, I proceed to apply my bibulous layer, securing a strict adaptation in contact with the blanched pulp, when the operation is completed by filling temporarily with osteo, or lining the cavity with this material, and inserting a good amalgam filling; or if a gold plug be contemplated, it is wiser to fill with osteo, and defer the gold filling for a reasonable time.

Difficult situations may be met by freely filing away the tooth; and I am bound to contend from experience—without wishing to lay down a hard-and-fast rule, each case presenting its peculiar features—that the above treatment, with certain modifications, meets all cases of exposed dental pulp, be they healthy, irritated, inflamed, or suppurating, when this organ has not become irreparably gangrenous or dwindled to dimensions of dead matter only to be met by extirpation and fang-filling; and I think this treatment, carefully carried out, commends itself for,—

1. Simplicity and painlessness.
2. Time saving.
3. A general absence of supervening symptoms.
4. Its wide applicability to all cases of exposed vital dental pulp; and,
5. Its *rationale*, taking the peculiar *habitat* of the pulp into consideration, is sufficiently analogous to the surgical treatment of other lesions of the body.

I am persuaded that topical treatment stands first in the way of

removing local irritants, and that we have a right to count much upon the recuperative power of the pulp,—that *vis medicatrix naturæ* which befriends us in the treatment of other lesions of the body, from cuts, splinters under the skin, burns, etc. The peculiar diathesis of the patient may favor or retard the progress of healing, and in so far the local treatment may be seconded by judicious antiphlogistic remedies, aperients, and astringent lotions. Constitutional depression of vital power or exhaustion after illnesses simply points to the necessity for temporary local expedients; but the principle of the local treatment advocated must not be departed from.

I desire to give emphasis to one feature in the treatment, and that is, whatever the state of an exposed pulp, short of gangrene, *cut down to it*, or level the adjacent dentine with the pulp's surface. I am convinced we cannot treat it effectually so long as a space exists between the pulp and the aperture leading to it,—a fact which has more than once been impressed upon my mind through a carbolic acid dressing failing to blanch the pulp, showing that the caustic had not touched it, as the inevitable result of contact is a white film or eschar. It is at this point that most operators stop short in their conservative treatment of diseased pulps. Mr. Woodhouse says, in his paper already referred to, "When he ascertains that the pulp appears shrunk into the cavity, he at once decides to destroy it, as he considers it a sure sign that its vitality has been lowered, and that it would therefore perish under conservative treatment." A deduction which I believe to be erroneous.

If the pulp be inflammatory, it may with advantage be made to bleed, so relieving the hyperæmic condition; after which gentle syringing with carbolized warm water will have a beneficial effect, and prepare it for a temporary dressing.

I think the happy results attending the above treatment tend to show that the local destruction of the odontoblast layer does not prevent ossification of the pulp; but the greater our success the less our opportunity of gaining information as to the actual physical changes in the pulp so treated. Time will undoubtedly clear up the difficulty when such teeth, from remote causes, may come back to us.

When we are exceptionally baffled, and untoward symptoms succeed our efforts to save a pulp, we have an alternative in the operation of rhizodontripsy, and I, among others, set a high value on this expedient.

Fifteen years ago arsenious acid was looked upon in America as the most important article in the dental pharmacopœia, because it enabled the dentist to achieve far more in conservative dentistry than any other one thing (the DENTAL COSMOS for April, 1862). But this so-called "conservative dentistry" meant the preservation of a tooth minus the pulp,—*"the shell without the kernel."* I trust the dental student of to-day is imbibing a truer perception of what should be paramount in preserving the teeth. I mean the conservation of the dental pulp.—*Selection from Abstract of a Paper read before the Odontological Society of Great Britain by Mr. George Henry.—Monthly Review.*

SUCCESSFUL TREATMENT OF SIMPLE RANULA SALIVALIS BY PROBING.
—The few cases of simple ranula salivalis which have come under my observation were obviated by cutting out a small piece of the duct of Bartholine.

At the end of last September a married lady, twenty-three years of

age, consulted me for this trouble. The tumor, situated on the left side, consisted of a pellucid oblong sac, extending from about a line and a half of the frenulum of the tongue backwards to the sublingual gland, interfering to a considerable extent with mastication and speech. As the patient believed herself to be near the term of her first confinement, and being of a nervous disposition, she wished to postpone an operation. I explained to her that the operation was but trifling, and could be performed any time without inconvenience. Thinking, however, over the nature of the difficulty, which was on the increase, it afforded me a favorable occasion to try to free the passage by probing. Therefore, finding at a short distance from the caruncle under the tongue a minute, round depression, I worked on it by gently turning, for a little while, between the thumb and forefinger the pointed end of a probe. This retired, I perceived a moisture coming out of the depression, like in the normal state. The swelling was then very slowly decreasing, but four weeks after the duct had entirely contracted and the parts had returned to their normal appearance.

I would like to recommend this simple manipulation in similar cases as the most appropriate treatment.—*Wm. Keller, M.D., in American Journal Medical Sciences.*

ALVEOLAR HEMORRHAGE.—I was asked to visit a lady who for many hours had been suffering from hemorrhage after the extraction of a tooth. I found that the cavity of the tooth from which the blood flowed had been several times firmly plugged with cotton saturated in a solution of perchloride of iron. By this means the bleeding had for a period been stanchcd, but it as constantly recurred, forcing out the plug. During the time brandy had been frequently administered, in order, as it was assumed, to keep going a heart which flagged speedily when the stimulant was long withheld. I found the patient scared, prostrate, and restless, the action of her heart rapid and feeble, and the bleeding from the cavity free. When I attempted to examine the mouth she vomited, throwing up some blood that she had swallowed, with fluid matter—a part of the last drink she had taken. After this she became faint, and I then succeeded in filling the cavity with styptic colloid on cotton-wool, plugging firmly from the bottom of the cavity, particle on particle, as a dentist stops a tooth with gold. The hemorrhage once more stopped. I insisted on the withdrawal of all stimulant. I placed the patient recumbent, got her to swallow slowly a good draught of warm milk containing a little lime-water, and allowed her to recover from the faintness without any enforced reaction. The result was all that could be desired. The hemorrhage did not return, and when the plug came away, a few days later, there was a firm healing surface beneath. The strength of the patient was rapidly restored.

From this time onward I have substituted warm milk for alcohol in every case of hemorrhage I have been called on to treat, and I am satisfied that the new treatment is safest and soundest.—*Dr. Benjamin W. Richardson, in The Lancet.*

SWALLOWING ARTIFICIAL TEETH.—The annals of dentistry furnish us with many examples of the dangers arising from keeping single false teeth in the mouth when retiring to sleep, and the following case furnishes a notable instance of it. It has many points of resemblance with one recorded in the *British Journal of Dental Science* for October,

1869, both from the nature of the accident and the method of procedure used in the extraction, while its distinctive features will be apparent from the history.

On the morning of September 3d a messenger came in great haste to my house, asking me to go with all speed to Miss L. H—, as her friends thought she was choking. On inquiry, I found that during sleep a plate of platina with two teeth attached had become dislodged, and had been swallowed. A medical friend being with me at the time, I asked him to accompany me, and, taking with us a probang and throat forceps, at once hastened to afford her relief. On arriving I found my patient sitting on a chair, retching, and complaining of great pain in the œsophageal region. There was a slight trace of blood in what she ejected, and she was in a state of great excitement. I made a careful examination of her throat, hoping to be able to see or feel the plate there, but could not detect it. I then gave her a little water to drink, but this increased the vomiting, and caused her a considerable amount of pain. I immediately proceeded to pass the probang, and having introduced it to a considerable length, I drew the spring and pulled it smartly up, when it came out with a slight resistance. She then told me she felt as if something had torn her throat, and that she felt easier. I then re-examined her mouth, passed my finger in, and discovered the plate at the base of the tongue, and with a little difficulty, owing to the sharp spikes at its end, extracted it. For a few days my patient experienced considerable pain in swallowing; she was placed on farinaceous food, and made a rapid recovery.—*T. M. Dolan, L.R.C.P.E., etc., in The Lancet.*

SWALLOWING OF FALSE TEETH.—Dr. Craig for Dr. G. Dickson showed a gold plate of considerable size, carrying two false teeth, and having hooks at its ends. This had been swallowed during sleep by a young woman on Christmas day, and had stuck for a time about the level of the midsternum. An emetic had failed to relieve; so, by a probang the plate was forced into the stomach. She was then ordered to eat quantities of thick porridge, in which sewing threads cut up into finger lengths had been mixed, also to take figs, raisins, etc. The plate was passed on January 2d, wrapped up and protected in the threads.—*British Medical Journal.*

HINTS AND QUERIES.

WILL some one please give the best method of removing calcareous deposits from the roots of teeth, and the subsequent treatment?—G. F.

WILL some one who thinks himself competent inform me how to cut, grind, file, saw, wedge, or other way separate the teeth *permanently*?—CLAPP.

I WOULD like to know what course Philadelphia dentists pursue with aching milk-teeth too far gone to save.—P. A.

WILL some reader of the DENTAL COSMOS oblige me by indicating the means to be used in distinguishing the existence of fungi in carious teeth?—JUNIOR.

WILL some one give me a plain explanation of the character of the sores so frequently met with on the lower lip, and occasionally within the mouth, which are so defiant of treatment, and which are so apt to run to a fatal termination?—C. F. E.

WILL some one please inform me as to the length of time usually required for the exfoliation of a dying lower jaw, and the best course to pursue in the interim?—C. L. M.

A GENTLEMAN has just consulted me concerning an intermittent pain which locates itself in the right temporal region within the skull, and which he is disposed to attribute to a filling recently inserted in a bicuspid tooth. Is this likely to be the cause?—C. S.

WHAT will prevent celluloid changing color after being worn a short time in the mouth?—KNOWLEDGE.

WILL some brother dentist explain how to take the *bite* prior to articulation in full cases? Some one that knows just how, please take pity and explain to a weary pilgrim in dental paths.—GEORGE DILLON.

REPLY TO A. L. D., who asks for general rules for the treatment of hemorrhages. Hemorrhage attendant upon operations performed about the mouth, jaws, or face requires to be considered both from constitutional and local stand-points; from the first, because of conditions which, when present, set at defiance the ordinary local means employed to arrest bleeding; from the second, because of the diversified plans demanded by the emergencies and exigencies constantly presenting in practice.

It is recognized that in some persons there exists such disposition to hemorrhage that breaks in continuity of tissue, however slight, are attended with more or less danger to life, many cases being on record where, from the scratch of a pin or extraction of a tooth, bleeding has continued to a fatal termination, and this in defiance of treatment directed by the most skillful. More expressive of the existence of a hemorrhagic diathesis are the multitude of instances to be met with in consulting both medical and surgical writers, where spontaneous hemorrhages have ceased only with the life of the persons affected. As an example of such predisposition being hereditary, allusion may be made to an illustration cited by a Dr. Riecken,* where, out of a family of twelve children, four died of hemorrhage; and a sister who escaped, and who married, lost three out of six children from a like cause. Numberless instances of a similar nature might be quoted. The writer has met with illustrative cases within his own immediate experience, and no doubt like examples are familiar to most, if not to all, practitioners.

The causes of a hemorrhagic predisposition may be classed with the conditions which predispose to the disease known as purpura; these being various, are to be appreciated in order that treatment may be judiciously directed.

Hemorrhage of constitutional import has its expression in capillary oozing; it is not of continuous flow, as when veins are cut, nor is it in jets, as when proceeding from several arteries; but it is common to the full surface of a part that may have been exposed, whether by design, as when operations are performed, or by accident, as when breaks in the continuity occur from laceration.

In the treatment of hemorrhage associated with diathesis, the indications are found to issue from one of two stand-points: either there is a deficiency in the coagulable elements of the blood, or otherwise there is lack of contractile power

* See Wood's "Practice of Medicine."

in the capillaries. In one or the other of these exists the condition requiring direct treatment, whatever may be a predisposition back of it. So far as the first of these is concerned, the requirement is met by the use of lead and opium, a very good formula for which is as follows:

R.—Plumbi acetatis, gr. xii;

Pulveris opii, gr. vi.

M.—Ft. pil. No. vi.

S.—One to be taken each two, three, or four hours, according to urgency of case.

In the use of this combination no hesitation need be felt in administering even double the quantity above prescribed, although it is well to be on one's guard.

It is, however, oftentimes plainly enough evident that want of coagulability arises out of impoverishment of the blood; here great advantage is to be derived from the free use of iron, preference being given to the muriated tincture, of which as much as twenty drops may be given each two hours in conjunction with one-half grain of quinine. Tannate of iron is a preparation to which, however, many give the preference over the muriated tincture, the dose being three grains, exhibited in pill form, repeated each two, three, or four hours.

When the pulse is full and bounding, veratrum viride is a valuable medicine. A good form in which to employ it is the tincture, of which eight-drop doses may be prescribed, repeated each three hours until the number of heart-beats is materially lessened. The writer esteems this as among the most reliable means at the command of the surgeon in the treatment of threatening oozings.

Where hemorrhage is associated with plethora, the saline purgatives are to be freely employed, or, if the expression of congestion be very marked, it is good practice to bleed freely; the opening made in the vein to be large, and the upright position maintained until the patient gives evidence of faintness.

In hemorrhage associated with great dryness of the skin, advantage is gained by the employment of means revulsant to the more vascular parts, than which no medicine is more satisfactory than the pulv. opii et ipecac. of the Pharmacopœia, an excess of two grains of ipecacuanha being added to each ten of the common powder. The writer has frequently employed this combination with great advantage. Ergot as a hæmostatic is a favorite means with many. It is most conveniently used in form of the tincture, of which teaspoonful doses may be employed, repeated each three or four hours. The ordinary vegetable astringents, as met with in the shop of the druggist, are freely prescribed, kino being, perhaps, most of a favorite.

Of local means to be used by the oral surgeon, and by him particularly, nothing equals in reliability the ligature. An artery tied may be considered safe; all other means are makeshifts, liable to fail at any moment. It is to be accepted as a rule, one not well to break, save in compulsory cases, that cut arteries can and are to be tied; few things more untoward can happen than the springing of a vessel after a wound has been done up; from such accident the most formidable of complications are evolved, and from such neglect cases the most simple are transformed into the most complex.

It is in arteries associated with bone that temptation is found strongest to try and get along without ligation; this is not to be wondered at, considering the obstacles met with in these cases, as far as facility is concerned in getting a retracted vessel from its sheath and canal and in placing a ligature; the writer would offer this difficulty as among the most trying and puzzling with which

oral surgery has to contend ; such, certainly, is the inference of his own experience.

Neither is it always an easy matter to put ligatures about arteries which may be incised in operations upon the soft parts, as, for example, when vessels are cut in myotomy of the levator palatæ muscles, a section so frequently practiced in the operation for cleft palate, or, as in carcinoma, where every capillary seems converted into a jetting artery, or as in the case of vessels pouring out blood into the speno-maxillary fossa, concealing necessarily what is obscure enough at the best. Difficulty, however, is no warranty against secondary hæmorrhage, and a surgeon is unwise in closing a wound or in resorting to styptics until satisfied of the impossibility of doing anything better ; the difficulty of combating a secondary hæmorrhage may be multiplied by the troubles of a primary ten times repeated.

A character of case where the direct employment of a ligature is impossible exists in carbunculous sloughings, but here, happily, the potential cauterization necessary to the treatment of the gangrenous part is found a reliable means for the control of the bleeding. In the hands of the writer this means has not as yet failed, although opposite experiences without number are on record. If failing, other means, to be presently alluded to, must be tried.

Ligation of the main trunk of arteries, branches of which are the bleeding vessels, is frequently found necessary ; thus the temporal is ligated for bleeding wounds on the side of the head, the internal carotid for the maxillary, the facial for injuries of the cheek, the lingual for accidents to the tongue, the supra-orbital for sloughs on the forehead, etc.

Cold water, plain or medicated, employed in the form of spray, or thrown over a bleeding part by means of a syringe, serves an excellent part, its action being upon the muscular coats of the vessels, exciting them to contraction. No bad secondary effects can possibly ensue.

As a medicament to be added to common water, preference is to be given to alum, for, if this do no good, it can do no harm. This is very much more than can be said of a majority of the styptics.

Of the common means employed to arrest hæmorrhage, greatest exception is to be taken to the Monsell's salts ; the worst cases with which the practice of the writer has made him acquainted have been secondary to the use of these preparations ; if failing, the trouble becomes almost insurmountable : not that it is to be understood that they fail in every instance, or even in the majority, but one, after a fair experience with them, finds himself indisposed to take the risk involved in their use. The harm done consists in a debasement of the tissues, a debasement sure to result in a slough more or less extensive.

Pressure, as a means of control, finds its best signification where the immediately underlying parts are osseous. A knotted bandage placed over the facial artery where it lies in the notch of the inferior maxilla, or over the temporal just above the zygoma, is as reliable a means for the suppression of hæmorrhage connected with these vessels as may well be employed. In the bleeding which occasionally takes place after the extraction of teeth, a recourse that seldom fails, if properly appreciated, is found in a plate made to fit the parts accurately, which affords support to plugs occupying the alveoli. The writer, after this manner, has successfully combated many cases of bleeding alveolar arteries after almost every other means have been tried and found unsuccessful. The method of making such plates is, of course, too well known to render necessary any description.

As an example of hemorrhage met with in oral surgery, the following may not be without interest, so far as the treatment pursued is concerned: M. A., a young colored man, of most decided hemorrhagic tendency, applied to a dentist for the extraction of the second molar tooth of the left upper jaw. In the operation much bruising of the soft parts and comminution of the alveolar process occurred, which resulted in a hemorrhage of such persistency that the patient, greatly alarmed, sought his physician for relief. Two weeks were spent in vain effort to check the discharge, the man being brought to the door of death, while no manifestation of stoppage showed itself on the part of the bleeding. The hemorrhage as first seen by the writer emanated from a large surface resulting from a slough consequent on the employment of Monsell's salt, the ferri persulphas. In taking the case in charge, effort was made to secure a surface on which capillaries might be found possessed of sufficient vitality to contract by cutting away the semi-gangrenous face of the ulcer. In accomplishing this, jets were made to issue from the posterior palatine artery, and attempt was successfully made to inclose the vessel in a ligature, successfully as the act of securing the artery was concerned, unsuccessfully as was concerned the ability of the part to hold the ligature, the vessel cutting through on three separate trials. Next, pads of linen were fitted over the parts, and the jaws were firmly bound together by means of a properly adjusted bandage. As medicaments, iron, lead, and opium were exhibited, yet despite such care the oozing continued to an extent little able to be borne by the man in his very weak state.

As the vessel chiefly involved was the posterior palatine, its ligation at a healthy portion was seen to be a necessity; such ligation was accomplished at the point where it winds around the tuberosity of the maxilla, a curved needle, such as is used for passing the wire in cleft-palate operations, being employed. Referring to the shape of this needle, it will be recognized that its point may easily be insinuated between the vessel and the bone, and that the ligature may thus be carried beneath the artery. A succeeding step consists in incising through the soft parts confining the ligature until it is allowed to come in contact with the vessel; it is then to be tied after the ordinary manner. So far as the writer knows, this is the first case in which this artery has been ligated for the purpose of controlling an alveolar hemorrhage; so far as he can judge, without its ligation in this particular case the patient must have bled to death.—A. B. C.

IN reply to "Junior," who asks as to the treatment required for caries affecting the grinding faces of all the molars of a child two years of age, it is suggested that analysis be made of the oral fluids, and that these be placed as quickly as possible in an inoffensive state.

Nothing is less effective than an attempt to save by strictly mechanical means a set of teeth exposed to continuous contact with destructive agents. Where caries exhibits itself in so young a patient, a vice lies back of the teeth themselves, and this vice, whatever it may be, is that which demands first attention. As a material for filling in such cases, decided preference is to be given to tin-foil.—A. B. C.

PRACTICAL IDEAS ON OPERATIVE DENTISTRY.—For the purpose of contributing to the interchange of practical ideas upon operative dentistry with our fellow-practitioners, the following suggestions, derived from our own experience and investigations in the very important matters they refer to, are thrown out with the hope that they may be found of use to some of our professional brethren, and of resultant benefit to their patrons. Each subject is treated as briefly as clearness in explanation will allow:

1. *Separations*.—In separating teeth, whether for filling or to prevent further decay, it should be done so as to keep the teeth, as nearly as possible, precisely where we leave them when the operation is completed. This, we think, is especially essential in cases of proximal fillings. The teeth should not be allowed to come together again, except at the neck above the fillings, and the fillings should never touch each other. And we will remark, just here, that we know of no mode of operating to accomplish these separations as effectual and as satisfactory as the method advocated by Dr. Arthur. His double V, which leaves tooth-substance at the neck of the teeth, unless too badly decayed, to prevent fillings from coming in contact with each other, and which, at the same time, gives or leaves in the majority of cases a self-cleansing surface, is just what is needed. There is objection urged by many operators to these V-separations, on account of the liability and inconvenience of the wedging of food in the V-shaped aperture,—tough beefsteak, for instance, such as sometimes intrudes itself upon the tables of our first-class boarding-houses; but we hold that such disadvantage does not often result to the patron, and where we have observed it we have noticed that it has been in cases in which there was simply a V-shape, and not the double V, with a self-cleansing surface. If an account be taken of the number of cases that present themselves in a certain period, in which so much trouble and annoyance are caused to persons through inability to remove particles of food because of the contact of the teeth and fillings, and if we consider the liability of teeth so situated to decay even after the most skillfully performed operation; and if, on the other hand, similar account be taken of the V-shaped separations made in the like period, which give trouble but are free from so great liability to decay, it will be found that the latter are greatly in the minority. From such practical investigation and comparison of the two methods, we have been led to adopt and to advocate the double V in operating.

2. *Rubber Dam*.—This useful invention, for which the profession is indebted to Dr. Barnum, has supplied a great desideratum in operative dentistry; and since its introduction it really seems that none of us could dispense with its aid in the majority of operations in filling. Its satisfactory adjustment to certain teeth is the source of considerable embarrassment to many operators, especially to teeth that are decayed high above the gum. Take, for example, incisors which are decayed above the gum on labial surface, reaching nearly the proximate surfaces. After excavating the tooth properly, a very sharp lancet should be used and the gum split perpendicularly with the tooth, a line or two above the decay, just as we would do if we were going to extract a root inclosed in the gum. The rubber should then be slipped over the tooth, and with a well-waxed silk or flax thread pressed steadily, with the aid of a common excavator or plugger, above the decay or cavity, and a knot tied opposite the split in the gum close to the tooth with the thread, and another knot about two inches from the first one, this enabling us to hold the thread steadily with our left hand, and at the same time have the use of the same member in steadying the head or jaw while operating.

Take, for another example, proximate cavities, where the teeth are decayed high above the gum, and the gum is perfectly healthy, firm, broad, and unyielding to pressure. After thoroughly excavating the teeth, the lancet should be used, cutting right through the gum between the teeth to the edges of the alveolar processes. Then a wedge of orange-wood of suitable size should be prepared, and the rubber slipped on the teeth, carrying the thread-like portion—the piece of the rubber that is between the holes when it is punched and

stretched—right through the gum. The wedge should be placed right on top of the rubber and pushed steadily through the divided gum between the teeth, the wedge thus being made to keep the rubber in place, and also to serve, at the same time, as a sort of matrix at the upper portion of the cavity.

3. *Filling*.—It is not proposed to discuss, in this brief article, the manipulation of all the different materials used in filling teeth, and we shall confine our suggestions to the combination of soft and cohesive gold. Our own method is to use both the soft and the cohesive in all cavities, be they large or small, using the soft foil next to the walls of the entire tooth or cavity, and building or finishing up with the cohesive. By operating in this manner, the walls of the cavity and tooth are more perfectly protected from the ravages of decay, and operations are finished to every degree of satisfaction. In our own practice, we have used soft and cohesive gold separately, making an excellent filling with either; but experience has taught us that we fail to operate with such certainty of success with either separately, as when we combine the two as suggested, and use the soft and the cohesive gold together.

To explain clearly our method, let us take a difficult cavity; for example, a posterior proximate cavity of first or second bicuspid in a state of advanced decay, with but very little undercut or anchorage at the neck of the tooth or at the sides. We take soft foil, first, to make the base of the filling, using the automatic plugger for condensing it, just as we use it for condensing cohesive foil; then we weld a pellet or so of cohesive foil to the soft, and thus continue using them alternately, the soft against the walls of the cavity, and the cohesive on the soft, to build up and support it and make a good foundation for the next pellet of soft foil. In operating in this way, there need be no fear, as there is no danger, of drawing the gold from the walls of the cavity, as with cohesive gold alone, in condensing. We are acquainted with no solution that will undermine a filling of this kind, and we feel quite sure that a filling perfectly made in this manner will protect and preserve a tooth from further decay more effectually than when accomplished by any other mode of operating.—D. HOPPS, D.D.S., *Savannah, Ga.*

A YOUNG man of sixteen called at my office at nine o'clock a few nights since, and requested me to remove a pin which he said he had lost in a decayed tooth while trying to remove some food which had lodged in it. The tooth designated was the right superior first molar, the crown of which had long since been broken off, and the roots were badly decayed. The gums had grown between the roots, and partly inclosed them. In trying to take it out before coming to me he had lacerated the gums until they were bleeding. I could find but two roots, which I extracted, but without finding the pin. The other root he said had been out for years, and I failed to find it; neither could I find the pin. He insisted so strongly, however, that it was there, that I removed the gum between the bicuspid and second molar, broke down the process with a pair of sharp forceps, arrested the hemorrhage, syringed out the cavity, and was rewarded by finding a fang about an eighth of an inch long, which I removed, and with it the pin. It was one and a half inches in length, and of brass. The root was decayed to a hollow cone, the head of the pin lodged in its apex, and the body passed through the canal into the antrum.—HAMLIN BARNES.

A LARGE MOUTH.—I have recently taken an impression of the mouth of a German woman, which measured one and three-quarters inches from front to back, and two and three-quarters inches across. Has any one knowledge of a larger mouth in a white person?—B. H. TEAGUE, *Aiken, S. C.*

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, AUGUST, 1876.

No. 8

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 342.)

It was contemporaneously with the varied materials mentioned, that a certain degree of resisting power was thought to be essential, and soon this idea quite generally usurped that of medication.

The result of this modifying influence first developed itself in what was regarded as a remarkable advance, and *cork*, in the form of a shaving, gave buoyancy to dental hopes.

In progressive dentistry this suggestion could not be permitted to remain as the sole dependence, and a thin plate of *ivory* was its rival.

This was considered a peculiarly happy thought, from the close analogy between it and the lost tissue; but both cork and ivory were supplanted by the use of a piece of *quill*.

This was one of the dental secrets, and I have been told, by several gentlemen, that they had each paid the price of fifty dollars for its possession.

Quill is, unquestionably, one of the best of its class of materials, as it possesses, in an eminent degree, the varied qualities of adaptability, non-conductivity and durability; and I have met, during the past ten years, quite a number of living pulps in teeth which had been exempt, until recently, from decay, and which had had this protection used in deep cavities twenty-five or thirty years before.

At about the same period that quill was used for this purpose, the still familiar household article of *agaric* (*spunk*) was suggested on account of its adaptability, its non-conductivity, and its *absorbent quality*.

This last characteristic was deemed advantageous, for it had already been noticed that an evident effusion of fluid had taken place under some fillings which had proven (according to the ideas of those days) futile attempts at pulp-conservation.

Much subsequent pain had eventuated in extraction of some teeth, instead of removal of fillings, and pulp-devitalization, and examination had led to the discovery of that moisture which would probably have been entirely overlooked had the fillings been removed in the mouth.

There were those, however, who had, theoretically at least, insurmountable objections to using so soft and yielding a substratum as agaric, and these were divided in the employment of *gold plate* (*gold foil*, folded in several thicknesses), *tin foil* (used in the same manner, and preferred from its lesser conductivity), and *thin lead plate* (sheet lead), which was also extolled from the known toleration of *lead* in soft parts, exemplified by the encysting of bullets, the application of lead compresses, etc.

Much success was claimed by those who used *sheet lead*, and I am occasionally informed by gentlemen, at the present day, that they yet hold this material in a high esteem, based upon much experience.

I can join with these, and, with all the varied results of a long practice; in cavities of comparatively slight depth, in consequence of loss of surrounding tooth-structure, where almost complete exposure of the pulp exists, and where *solidity of base* is a desideratum for the permanence of the thin filling which is to be introduced, I now occasionally cut a small piece from the sheet of *tea lead* (so called from its lining tea chests) which has formed a portion of my *inherited* stock from the earliest period of my dental recollections.

Asbestos was suggested, some thirty years since, as applicable in this connection, in consequence of its eminence as a non-conductor of heat and cold. I have never used it, and can therefore only mention it from the historical, instead of the practical stand-point.

It was at a period shortly after this suggestion of Dr. S. Brown, of New York, that the old ideas of court plaster and adhesive plaster were measurably recalled by the advocates of *pitch*, *balsam*, etc., upon gutta-serena, lin or paper.

It was asserted that much success followed the trials of these combinations, and, like some others of the old-time applications, they have their advocates even at the present day.

From my own experience I have found no advantage over the ordinary *adhesive plaster*; but I wish to be understood as teaching, that, for favorable cases of almost-exposed pulps, in good, recuperative patients, where all that seems requisite is a little help and some degree of protection, I know of nothing better than *adhesive plaster*, slightly warmed, for the purposes of apposition and adhesion.

It will thus be observed that, in such cases, I regard as excellent the *balsam dressing*.

Plaster of paris is a material which, in common with a number of other operators, I have used for many years.

It possesses many qualities which are desirable in doubtful and even extreme cases. Its exceeding plasticity; its non-irritant characteristic; its slowness to harden, giving ample time for easy and careful manipulation; its alkalinity; its degree of porosity after consolidation; its sufficient resisting power for any of the plastic fillings, oxychloride of zinc, gutta-percha, or amalgam, are all recommendatory of this capping; but its want of durability, if exposed to attrition, or even salivation, renders an exact practice necessary for success in its employment.

The most rapidly hardening plaster is slow enough for use in capping; the cavity should be dried as thoroughly as possible, and dryness from saliva should be maintained as perfectly as can be.

The cases most suitable for its use are those in which a large and *well-bounded* cavity exists, in connection with an almost or completely exposed pulp.

In these it is best to fill the cavity *completely full* of plaster of paris and allow it to harden until it is even harder than would be permissible in difficult impression cases; or, rather, too hard for comparatively easy fracture of the material.

I prefer to err upon the side of *thorough setting* of the plaster—after which, if the cavity be upon the buccal face of a tooth, I excavate to half the depth of the plaster covering and fill with red gutta-percha; this makes a permanent operation, if the “capping” proves a success, and I have quite a number of such, which are doing well after a trial of from five to eight years.

If the cavity be upon the mesial, distal, or articulating face, I excavate from one-fourth to one-third of the plaster and fill temporarily with oxychloride of zinc; these must, of course, be carefully watched, particularly those between teeth, and be renewed if occasion requires, until several months, at least, shall have given their warrant as to the advisability of a foil or other permanent filling.

When it is decided to introduce this, I should direct the removal of as much of the plaster of paris as is consistent with safety to the pulp and the maintenance of requisite strength of covering,—say three-fourths or four-fifths,—and having in view, during the preparation for filling, that convexity of the plaster which would ensure the greatest thickness of covering over the nearest approach to exposure, and that thinness of edge to covering which would insure the greatest amount of dentinal surface for the adaptation and subsequent support of the permanent filling material.

Gutta-percha has, for the past twenty years, been used in various

ways for the capping of pulps, and it is one of the standard applications of the present day.

It has been used, from the first, just as it is used now, in *sheet*, warmed, and gently pressed into position with pluggers or small ball burnishers; and in *solution*, either in chloroform alone, or distended, by the addition of benzole to a very thick chloroform solution.

In both these ways the dark gutta-percha, the various white gutta-percha stoppings (Hill's and others), and the red gutta-percha base plate have been employed with constant assertion of success.

The use of the sheet or small portion of warmed gutta-percha is quite uniformly that already given, but the use of the solution is varied by either dropping, or placing it alone upon and around the point of exposure, and allowing it to harden by evaporation, or by dipping a small piece of muslin or paper into the solution, and thus obtaining a vehicle for its application.

It certainly would ill become me to express doubts of the almost universal success which is claimed by some gentlemen for this method of practice, but I must here acknowledge that frequent as have been my successes in the adoption of this material, my failures far outnumber them.

I am, however, disposed to account for this in the knowledge that I practice in a community which is deprived of the *continuous* strengthening influence of salt or mountain air, and which has to counteract, by care and medication, the enervating effects which are usually ascribed to malaria.

And furthermore, in opposition to some reports of almost constant success, in my own and analogous sections, I would say that I never count as a success any trial of less than *five years'* duration; and even of these, I have, in quite a number of instances, had to record "failure" after seven, eight, and nine years of probation.

With me, a *success* is, when a pulp covers itself, and the tooth becomes a self-supporter, and is practically a healthy, vital tooth, and *not* when it drags out an existence of sickly vitality, succumbing after a protracted struggle of from three to six or eight years.

Indeed, experience has taught me that these teeth are not thus left in as good condition for after-usefulness as when they are subjected to the radical treatment of prompt pulp-devitalization.

I have noticed that the pathological condition thus induced is one of such chronic irritation as to render liable, upon slight cause, serious, and frequently uncontrollable, periodontal trouble, resulting in comparatively early death of the periodontium, necrosis of the root, and loss of the tooth.

As years of practice have yet given no settled, definite method of procedure in the capping of pulps, the idea of combining medication

with mechanical protection has more or less constantly been kept in view.

To this end the stereotyped *tannin and glycerin*; *tannin and creasote*; *acetate of morphia and creasote*; *acetate of morphia and carbolic acid*; and my own more recent combinations of *acetate of morphia and oil of cloves*, and *salicylic acid and oil of cloves* have been used with reasonable degree of promise.

These various combinations are introduced either *upon muslin or paper*, as are, sometimes, the gutta-percha solutions, or in the form of *thick paste*, covered with a thin *plastic zinc* filling material.

In this connection *collodion* may be mentioned as a mechanico-medicinal application; it is employed either in drop or upon muslin or paper.

Crystal gold (either Watts's or Morgan's) having been found useful, *when only partially condensed*, from its non-conduction, has been suggested as a vehicle for applying creasote, carbolic acid, or oil of cloves.

It offers the advantage of an indestructible material, and at the same time, of possible manipulation by more thorough condensation of the edges, so as to form a secure base for the compacting of the external filling.

Oxychloride of zinc (so called).—This preparation is practically an hydraulic cement, made by mixing calcined oxide of zinc, to which is added borax, pulverized silex, etc., and deliquesced chloride of zinc, thus forming a thin or thick paste, as desired, which soon hardens, with a very considerable degree of resisting capacity.

This article was first noticed about eighteen years since, under the name of "Sorel's Cement," and attracted considerable attention from dentists as a filling material, from its near approach to the color of the teeth. It was soon proven unreliable as a permanent filling, while in some rare instances it has maintained remarkable persistency.

It was, however, early recognized as likely to prove very useful as a strengthener and maintainer of color to thin walls of large cavities, particularly when markedly undercut in excavating, and also as a means for filling a portion of those deep-seated cavities which until then had been filled entirely with gold, tin, or amalgam.

I can now report quite a number of cases so treated, which are doing perfectly well after fifteen years of service.

Gradually, however, nearer approaches to pulp-structure were ventured upon by many operators, and as the results of this practice we find, probably, as diversified reports as upon any one subject related to dentistry.

While some practitioners of eminence extol the capping of pulps with oxychloride of zinc over a "wave" of creasote, they are yet at

variance in every society report as to whether the oxychloride should be mixed thick or thin.

It is conceded by nearly all of the advocates of this practice that more or less pain follows the application, but it is contended that this pain is the announcement of a degree of irritation which provokes the pulp to recuperative action, and is thus beneficial when not excessive.

They report "frequent cappings, with almost universal success."

But, again, large numbers of other practitioners, of equal eminence, condemn the practice as resulting in as "universal failure," and confidently assert that the *quiet* which supervenes is usually that of *death*.

These admit that the action induced is, sometimes, that which eventuates in "drying up of the pulp-tissue," thus preventing, in great degree, the future troubles incident to putrescent pulps, but contend that this is, by no means, so universal as is the death of the pulp.

I have been experimenting with this material as long, and I think as extensively, as any other practitioner, and from that experience I report *adversely to its employment*.

Not but that I have had many successes, some few over *exposed* pulps; but my failures have been in large proportion to my successes in cases of *almost-exposed* pulps, and success has been exceedingly limited in cases of *absolute exposure*.

In these experiments I tried the "bathing" with creasote, carbolic acid, and oil of cloves. I tried the various preparations of "oxychloride" offered for sale, and mixed them both thin and thick; but *time* (twelve years) has shown most of my attempts to be futile, and I think I have given ten times as much pain in these endeavors as I have in all the rest of my dental practice combined.

The first modification noted in the use of oxide of zinc was, in connection with my experiments, upon the suggestion of Dr. King, of Nashville, Tenn.

This is the making of a *paste of oxide of zinc and creasote*, and using it as a first application, or substratum, to the oxychloride covering.

This paste, together with the analogous ones of *oxide of zinc and carbolic acid*, and *oxide of zinc and oil of cloves*, proved remarkable preventives to pain, and thus far my experience has been, that just in proportion as I have succeeded in *preventing* "recuperative irritation" (!) so have I had promise of success.

(To be continue)

THE POTENCY OF FOOD IN MODIFYING THE MASTICATING APPARATUS OF ANIMALS.

BY A. H. THOMPSON, D.D.S., TOPEKA, KANSAS.

(Read before the District Dental Society of the Seventh Judicial District of the State of New York, at its Eighth Annual Session, held at Rochester, N. Y., June 6th and 7th, 1876.)

THE food-reducing mechanism of animal nature presents an infinite variety of systems of organization. The many plans of structure and peculiar features exhibited in different species of animals, and the almost inconceivable extremes attained in the various modifications of the masticatory apparatus, when studied throughout the whole realm of animal existence, are very wonderful. There appears to be a mutability of structure, an inherent changeableness of organization, that is peculiarly impressible by and responsive to some potent modifying influence; it seems to be capable of change in almost any direction, in reply to some dictating force, which induces such variety of form and character.

This infinity of variation we assume to be due to the modifying influences of the various substances employed by animals for food. (Using *food* in its especial sense of "what is eaten by animals for nourishment" (Webster), or "aliments which are confined to the organized kingdoms of nature."—Dunglison and Carpenter.) And we assume that the inconsistency of plan is due to modification of habits concerning food,—these habits being governed by the food supply. Slight variation of environments acting upon this supply, causing a diminution or augmentation of quantity, which remains as a constant condition for a long period of time, will affect directly the masticating apparatus. Acting as a persistent force upon a mutable recipient, the result must necessarily be change toward the direction of least resistance, and consequent modification of structure. This direction of change must be the one of conformation to the new condition, and adaptation to the characteristics of the food as employed.

There can be no doubt of the adaptation of the teeth and jaws of each species to the peculiar method of reduction that its food requires. This proposition must be accepted by teleologist and evolutionist alike, whatever hypothesis of the origin of animal structure he may uphold. All life throughout all time has depended upon the food supply for its existence and continuance; and the variation in quantity has caused the modification or extinction of all the forms that have lived upon the earth. Food, as a potent power, is second only to cosmical influences in determining the course and form of life; and as being the channel of dependence of animals for the nutritial supply, the masticating appa-

ratus must be adapted to the kind of food employed. As evidencing this, we see the finest conformation in all species. Slight changes cause, and have caused since the genesis of life, gradual alteration to a perfect adaptation to new conditions of food. Great changes, such as the sudden withdrawal of the entire food supply of a species, and the only resort being a new or remaining food of too great difference from the original, cause extinction of life through the incapacity for great and sudden alteration. Gradually slow, persistent deviations are the most potent of influence for change. Almost any species can tolerate a very slight alteration in its food, with little inconvenience; and a persistence of the change, inducing a tendency in a certain direction, will bring its modification of animal structure through the law of adaptation of form to environments,—food being an important factor of the environments of all animals, and one of the most influential.

Other conditions being in harmony, the persistence of the food supply will induce and determine the permanence of a given species or genus. The preservation of many forms through long geological ages must be due to this law,—as evidenced, notably, in the trilobite and some lizards and marsupials. The opposite condition—*i.e.*, rapid changing of food, fitful and inconstant conditions, and the rapid succession of extremes—will necessarily destroy life and cause the extinction of a species. The persistence of species, as well as individuals, is thus dependent upon the food environment and the adaptation of the masticating apparatus to the characteristics of the food supplied.

The susceptibility to change is imperative for the continuance of the life of a species. The digestive and assimilative powers of the organism are capable of converting all kinds of food into nutrient pabulum, within a certain range and limit; but to maintain life, the masticatory apparatus must be able to reduce not only all the varieties within these limits, but to *go a little beyond* their borders. Upon this capacity to reduce those few extremes of foods that lie beyond the normal limits of the food of a species depends the capability to change and maintain life when the emergency comes,—*i.e.*, if the species cannot endure slight alteration of food and conform its masticating parts to the new condition, it must become extinct. But, on the other hand, if it tolerate slow alteration and conform to it, survival is insured, so far as the food environment is concerned. In the remaining living species of animals we witness the results of extensive differentiation of structure in accordance with this law, through the slow process of adaptation to food alterations in the ages past, the result of compulsory conformation.

The factors that enter the arena as active causes of the phenomena of food changes are numerous and inconstant. Cosmical, climatal, and various physical forces and influences, inducing the diminution of the

food of a species, or the increase in quantity, or the development of peculiar qualities of the food, are perhaps the most active causes. To these may be added local and accidental influences inducing some gradual alteration, or the evolution of a quality or convenience, thereby creating a preference for the new condition. This preference may soon develop into a habit, and this, again, into instinct, and thence the change is assured. In all the changes, however, we recognize the all-powerful, ever-present influence of *food-selection* as the dictating force which is superior to animal volition in the choosing of food. It induces directly the survival, differentiation, or extinction of species in direct ratio to their power of conformation to change. It is not possible to enumerate the modes in which foods may vary, or how they may direct choice on the part of an animal. A few individuals of a given species, as an instance, may have a peculiar variation of their food presented to them in a particular locality, and may, by accident, prefer it. Preference becomes habit as the food continues, and this stage being reached natural selection performs the rest. But it is possible, also, that long continuance of a particularized food may so establish a highly organized masticatory apparatus as to suppress to an extent its capacity for change. After a time a sudden or even a gradual though extended variation may come, and the species perishes through inadaptability to new environments. The direction of least resistance may be too great or too small to induce conformation, and death is the only alternative.

The work of differentiation and conformatory adaptation of the masticatory apparatus and region has progressed onward through the eons until the contemporary result at our station in the march of time is an extensive and wonderful variation. But in all the variation and complexity we see a remarkable adaptation of means to ends, of instruments to purpose, of tools to material. The relation is so conspicuous as to render the teeth and jaws the most important diagnostic medium to the naturalist, especially in the work of identifying fossil remains. Specialized structure is so marked and variation so distinct as to render these parts more valuable for this purpose than the remains of other regions of the organism. The teeth being the least destructible of all tissues in organized nature, are most frequently found as geological remains of animals, and often where destructive forces have eradicated every other vestige of life. On account of their peculiarly indicative and specialized forms, they are especially valuable to correct diagnosis, and on them is founded the story of the life of many species that have lived and died in the great geological past. Through the course of the life of the ages gone by has been developed the great variation of which we are the contemporary witnesses. In a few forms the history of their growth can be read, but in the vast number we can only bring

up broken links from accidental tombs, where preservation of any vestige has been the exception.

In order to point out more fully the conformation of the teeth and jaws and their environments to the peculiar food each animal employs, and the effect that food-selection has had upon the evolution of these specialized parts, let us look at the organization of a few forms of animal life, living to-day, and read what they can tell us of their history.

Beginning with the class *Pisces* (Fishes), we find a remarkable variety of form presented. One characteristic is, however, conspicuous; large capacity for prehension being necessary for the quick seizing and retention of living prey, we find the jaws movable and capable of protrusion and retraction, as well as closing, to render them more efficient in this respect. This evidences development on account of the nature of the food of fishes, which, being living animals, induced this condition by their struggling and liability to escape. The teeth of fishes present a remarkable and unusual variety. The *Myxine* has but one tooth, situated in the roof of the mouth, with which it cuts into its victim and draws the life-juices. The *Tench* has powerful pharyngeal teeth for crushing purposes. The *Shark* has teeth, row behind row, erectile, and continually forming as they are lost. Its habits are well known. We cannot enumerate other species, but all indicate adaptation of form to use, and the line of development can often be followed easily.

In the *Reptilia* (Reptiles) we do not find as much variety. The predominance of prehension influences the form of the region, and the organization is simple. In the *Crocodylia* (Crocodyles) the jaws are purely prehensile, and studded with numerous conical teeth, which are perpetually renewed. In *Lacertilia* (Lizards), some of which employ their long, muscular, clubbed tongue as a prehensile organ, the teeth are small. The jaws and teeth of *Ophidia* (Serpents) are prehensile, and peculiarly adapted to the deglutition of disproportionately large objects. The jaws of *Chelonia* (Tortoise) are edentulous and horny, like the beak of a bird, being adapted to clipping soft weed, fuci, etc.

In *Aves* (Birds) the beak is the prehensile organ, and mastication is performed in the gizzard. The beak is especially modified to the food of each species; thus (according to Marshall), "It is short and strong in the grain-feeders; long and slender in the insectivorous warblers and fly-catchers; notched in other insectivorous birds, as in *Shrikes*; short and gaping in the *Swallows* and *Night-jars*, which catch their prey upon the wing; strong and hooked in the rapacious *Eagles* and *Vultures*, which tear up their food; long, conical, and of great strength in the digging *Rooks* and *Woodpeckers*, which pierce the bark of trees; short, curved, and of great depth in the *Parrot* tribe, which can crush hard nuts; exceedingly delicate and tapering in the *Hum-*

ming-birds, to enable them to penetrate the tubular corolla of flowers; ponderous and ungainly in the Horn-bills, Toucans, and Adjutants; long and strong, for catching fish, in the Storks and Herons; elongated and suctorial in the Snipes and Sandpipers, which seek their food in bogs and sand; flattened and sensitive in Ducks, Geese, Swans, and Spoon-bills; or it presents still other forms for holding fish, as in the Pelicans, Pilgrims, Albatross, Penguins, and Auks." In all these we see, again, adaptation of form to food.

In *Mammalia* we find the most important lessons for our purpose, and the most pointed evidence in support of our hypothesis. The prehensile organs in *Mammalia* are especially the lips of the mouth. But these are assisted frequently by other organs; as in *Bimana*, *Quadrumana*, *Rodentia*, and *Marsupialia* by the fore limbs, in the Elephant by the proboscis, in the Tapir by the snout, in the Ant-eater and Giraffe by the tongue, etc. The teeth and jaws of *Mammalia* present as great variation as their food is varied.

The *Rodentia* possess a very peculiar dentition, the main feature of which is the long, curved incisors in each jaw, which grow continuously, and serve to gnaw bark and nuts, where their food is found. The arrangement of the tissues in these teeth, which causes the wearing to preserve a sharp edge, is well known, and is peculiar to the order. The triturating molars are much the same as in the allied forms.

The *Insectivora* are also distinguished by their dentition, the molars bearing peculiar summits furnished with numerous cusps, which, with other characteristics, adapt the teeth to insect food.

In *Cheiroptera* the insectivorous species have a dental formula that sometimes presents absence of the incisors. The frugivorous Bats possess more numerous teeth, and adapted to their diet.

Many of the *Bruta* are perfectly edentulous; others possess teeth consisting of dentine only, and are monophyodont. The centrals are never developed and the canines rarely so. The molars are cylindrical and adapted merely for crushing the food, which consists of leaves, buds, and young shoots of trees, but cannot grind it. The stomach compensates by possessing a complicated arrangement for digestion, there being no rumination. The Armadillos, which are insectivorous, possess a great number of molar teeth for crushing the frequently dense and resisting exo-skeleton of tropical insects, as the Coleoptera.

The *Sirenia* are diphyodonts, and possess incisors and molars adapted for browsing upon and reducing the sea-weed and fuci of rivers and coasts.

The *Cetacea* are either edentulous or monophyodont. *Balænidæ* are toothless, although numerous rudimentary teeth are found in the jaws in early fœtal life, exhibiting a former condition in which teeth were possessed and used. Now, however, the teeth are usurped by "ba-

leen" or whalebone, which fringes the mouth, and by means of which small sea animals (chiefly *Pteropoda*), which are its food, are strained from the water. *Physteridæ* (Sperm Whales) possess large conical teeth in the lower jaw, while those above never erupt, but remain as rudiments in the jaw. They feed upon larger sea animals, *Acalephæ*, etc. *Delphinidea* possess teeth in both jaws, which are often curiously modified; as in the Narwhal, with its prodigious left superior central developed into a formidable weapon. The right central barely cuts the gum, thus exhibiting excessive development of a tooth for special purposes, and suppression of its mate on account of consequent disuse.

The *Ungulata* are all diphyodont, and possess enameled molars with large crowns. The *Proboscidea* have no canine teeth, but the incisors are developed into large tusks, which in the Elephant grow from the upper jaw, in the Dinotherium from the lower, and in the Mastodon from both jaws. Large molars are associated with these peculiar teeth, as many as six sometimes being found on each side of each jaw. The obtaining and mastication of the coarse vegetable foods of these animals necessitates the remarkable dental structure presented.

In *Perissodactyla* numerous incising and grinding teeth are present for the reduction of vegetable foods which require so much manipulation, especially as there is no rumination. No order affords stronger evidence of "descent with modification" than the *Ungulata*. The Horse is traced by a succession of the finest links; first, back to the three-toed *Hipparion*, thence to the *Anchitherium* of the Eocene, in which there were three toes and distinct and perfect fibulæ and ulnæ. Many other species of this order can be traced in their descent with more or less distinctness.

In *Artiodactyla* the teeth are not all developed, some as a rule being abortive. The dentition of *Camelidæ* is peculiar, as only two canine-like incisors and two true canines are found in the front upper jaw. The *Muschidæ* possess canines in each jaw, the upper ones being prolonged into tusks for the digging of roots of shrubs.

The *Cervidæ* and *Cavicorniæ* (Bovidæ) possess no incisors or canines in the upper maxillaries. The inferior incisors are adapted for the close cropping of grass, and as the most of these animals depend upon rumination, the masticating capacity is less pronounced in respect to force than in the non-ruminating *Ungulata*.

The *Hippopotamidæ* possess "a huge ragged row of teeth, some serving to rake the aquatic herbage together, others to cut it, and others to grind and masticate it. The lower canines form great shoveling tusks."

The *Suidæ* are characterized by the curling, half carnivorous canines and irregular dentition well suited to their irregular diet. In

these animals artificial selection has done much, in the domesticated species, to reduce and stunt the dentition.

In *Unguiculata* the first order, *Carnivora*, "comprises the great banditti of nature in the fierce beasts of prey, and are specially distinguished by their claws and dentition." The teeth are usually mere cutting implements, the canines being largely developed, and serving as powerful lethal weapons. There is much similarity throughout the extensive order, as the diet is much the same in all its ramifications. The food, being animal flesh, is easily reduced, and requires only cutting in pieces by the teeth.

Pinnigrada live upon fish, and possess teeth adapted to the capture and reduction of its prey. The Walrus presents a peculiar form of superior canines, which are long, tusk-like, and nearly vertical. These are conformed for locomotion out of water and for battle.

Plantigrada possess molar teeth that are flatter than other carnivora, in correlation with a mixed and often frugivorous diet. This is observed in Bears, Raccoons, Badgers, etc.

Digitigrada comprise the true *Carnivora* which subsist upon flesh, and possess an adapted dental armature and mechanism,—i.e., trenchant teeth, strong, short jaws, and powerful occluding muscles.

The *Quadrumana* present considerable variation within certain limits in conformity to varieties of foods. The dental formula is much the same as in man, with variation, usually, as to the greater number of pre-molars and incisors, in the teeth never being on the same level, and possessing diastems. *Lemuridæ* are frugivorous, and possess six incisors and six pre-molars in each jaw, conformed to their food.

Platyrrhinæ in some forms possess the same dental formula as man, and it is adapted to insect and mixed diet.

The *Catarrhines* include the anthropoid Apes, which have the human formula, and differ principally in size, in the length of the canines, and in possessing diastems. Their masticating organization is adapted to frugivorous and vegetable diet, nuts, etc., strength being a main feature of organization.

In *Bimana*, Man, we find the summits of the teeth nearly on a perfect level, diastems are absent, and the parts are reduced from the conditions found in other *Anthropoidæ*. The teeth of man are conformed to a mixed diet, and are in the main rudimentary.

In thus noticing some of the peculiarities exhibited in the adaptation of the masticatory parts to the foods employed, and considering that food is the modifying force, we see what variations have been evolved by its influence. It is evident, of course, that the masticating armature, the teeth, frequently perform other duties in the service of the animal economy than the mere manipulation of food, but it is none the less true that all these purposes are secondary to the main occupation

for which the teeth were developed, which is, the reduction of food preliminary to digestion. The secondary uses of the teeth may be included in the following enumeration: (1) as secondary sexual organs, and other battle purposes; (2) as assisting locomotion; (3) as aiding in the production of vocal sounds, etc. We cannot assume, however, that the teeth, as such, could have been developed for these secondary purposes primarily. If they had not been evolved for food manipulation in the first instance, as their complete history unmistakably indicates they were, these minor uses would have been left to other organs. It is true, of course, that secondary uses have developed particular teeth to an extreme that would not have been attained by the force of food selection, but yet the primary presence of the teeth is due to food requirements alone.

We assume, then, that the teeth and masticating apparatus of animals were developed for the purpose of reducing food preliminary to its digestion; that the food of animal nature is the all-potent force in dictating and causing the extensive variations that we witness to-day, and in sustaining or altering specific forms of the masticatory region; and that food, as an environment, is one of the prime factors in determining the course of animal nature.

PHASES OF PROFESSIONAL DEVELOPMENT.

BY W. C. HORNE, D.D.S., ROME.

Second Paper.

LOOKING back for a period of about twenty years from the present time, there was then to be found among the many practitioners of dentistry in New York a marked lack of sympathy in thought and action. It was a complaint made against some of the most eminent of the number that success had engendered in them an *hauteur* not in keeping with their professional character. Perhaps there was ground for such charges; those, if any, against whom they were justly made might take example from other life-long laborers in many fields of knowledge, crowned with the fairest laurels which art and science can bestow, but whose brightest crown has been their own ardent devotion to the search after wisdom, and unaffected fellowship with humbler but not less sincere votaries. Yet a degree of allowance should be made for that vanity which is too often the last infirmity of great minds as well as the first of weak ones.

The American Society of Dental Surgeons, vexed by differences, bitterness, and bigotries which there was no mantle of charity to cover, had passed away, to be succeeded by other organizations. But there was a marked absence from these gatherings of many men to whom

our profession in New York had accorded a distinguished position. The *séances* lacked interest, there was a dearth of enthusiasm, and gradually they settled into a state in which they had a name to live, but were dead.

The Brooklyn Dental Society for several years held a warm place in the sympathies of a large number of the most promising of the younger dentists of New York and Brooklyn. Eminently social in its character, it afforded occasions of agreeable reunion among a coterie having common points of interest, and many acquaintances thus formed ripened into high esteem and valued friendship. A good result of these gatherings was seen ere long in the lively interest awakened in the investigation of the subjects which occupied these evening hours. A revolution was effected in the practice of a large number by the adoption, not without much effort and severe application, of practices and methods heralded by different leaders, but not heretofore in very general use. A large class of cases heretofore condemned as hopeless by general assent began to occupy the curative efforts of these practitioners. The devitalization and extirpation of exposed nerve pulps, as well as various ingenious designs for the saving alive of this delicate and refractory organ, and the curing of alveolar abscesses, became the staples of conversation and of theses. Some even reached after that great desideratum, the restoration of absorbed alveoli. The cohesive property of gold-foil received much attention, in connection with the new feature of consolidation by mallet force. It may be questioned how far the change from "soft foil" to "cohesive" would have been generally accepted, had it not been supplemented by the mallet, brought into notice by the persistent energy of Dr. W. H. Atkinson. His advocacy of the value of the new instrument, accompanied by his skillful demonstrations, occasioned its wide adoption. He was the apostle of a new style of practice, and great success attended his efforts to improve the quality of the operations of a large class of dentists. How much the many are indebted to his instructions and example they may be unable or unwilling to estimate; but he deservedly ranks with the foremost of those who have illustrated the annals of dental art, science, and literature. The general adoption of the mallet created a demand for a different class of instruments and appliances, the supply of which advanced step by step, from the coarse-pointed pluggers, at first thought indispensable, to the delicate, finely-finished instruments such as bear the name of Varney, as well as the automatic mallets, of which that of Foote claimed our earliest admiration. A great boon was secured, carrying the dental operator far on to his goal, and relieving him of many pains and failures (thanks to the ingenuity of a modest and faithful worker), in the appliance known as the Rubber Dam. Another contribution to the interest of the gatherings above mentioned was the

microscopic examination of dental specimens, under the care of our departed brother Varney, than whom a more loyal heart and skillful hand might hardly be found in the range of his profession. But time would fail me even to make mere mention of the aids to ease and excellence, both in the operative and mechanical branches of our art, souvenirs of those days which are to be found in every dentist's studio, from the luxurious operating chair to the delicate nerve broach.

Arriving now at a period about ten years past, there is to be noted a decided movement of advance, indicated by the establishment of the New York College of Dentistry in 1867, the formation shortly after of the New York Odontological Society, and the passage, in 1868, by the Legislature of New York, of an Act for Regulating the Practice of Dentistry, and incorporating a State dental society, with subordinate branches, and the general adoption by dental societies of the code of dental ethics recommended by the American Dental Association. Those familiar with the events which attended the formation of the college, the procural of its charter, the pledges given for its support, and the influences which were combined in its favor with infinite pains by the efforts of the early promoters of the design, know also with what painful disappointment they saw the object of so many hopes, ushered into life with such bright prospects, made the subject of jealousies, strife, and at length a victim to a pronounced determination to rule or ruin. After repeated but fruitless attempts to disembarass themselves of the incubus which had fastened itself upon the institution, many of its early and warm friends became alienated from its further support or sympathy. Happily, of late years the institution has flourished under changed and more favorable auspices, having regained, it is hoped, the good will of all, and having to dread the envy of none. But the distractions growing out of this state of things had invaded all the then organized dental societies of New York, throwing a blight upon their prosperity. Feeling deeply the evils of the situation, it was proposed to seek a remedy by forming a new society which should exclude the known discordant elements, and offer a neutral ground where all that was desirable in our home circle of New York and Brooklyn, and widening as occasion demanded, might meet without dispute, not to forward private aims but to promote mutual professional improvements. This scheme having been devised and perfected by a very few, some others were invited to aid in its execution. The name, with some of the features of the organization, were adapted from those of the Odontological Society of Great Britain, while in other respects the constitution was framed in accordance with the best judgment of the founders. It was incorporated under the name of the New York Odontological Society, being the first dental society in the State having any legal status. It was not deemed desirable to embrace a large

membership, but rather to confine the numbers to just what were necessary for the work of the organization, offering at the regular meeting such materials as could be compassed to entertain or instruct the guests, without putting upon the latter any of the burdens of membership. As it had been observed that a large portion of the time spent in various dental societies was frittered away in arranging details of business and modes of procedure, it was determined to confine such matters to the proper officers, referring to a general vote only important affairs that might seem to require it. Untrammelled by pledges to any college, to any protective or unprotective unions, to any system of operating, ignoring the division of yesterday and the cliques of to-day, the endeavor was made to act in accordance with the spirit of the motto, "Some good in all, but none all good." Without formulating rules which might deprive the association of some of its most worthy friends, not graduates of any dental college, perhaps for the reason that their length of practice antedated the time when dental diplomas began to be the mode, it was yet determined from the incipency of the movement to exclude any of that class who find it necessary to vaunt their own achievements in the columns of ephemeral publications.

An epitome of some of the thoughts with which the originators of the Odontological Society were impressed may serve as a means of comparison at this day between the aim and the accomplishment; as, for example, Providing a systematic course of experiments for determining questions in dental pathology and therapeutics. Obtaining better materials, instruments, and appliances, and offering every facility for their test and adoption when found valuable. Encouraging freer professional intercourse with a view to a mutual appreciation of ideals, and corresponding efforts in their development. Assisting in representative associations in carrying out designs for regulating the practice of dentistry, and for establishing a certain code of professional etiquette. Upholding a superior standard of dental education by requiring from office students thorough preliminary training, and full compliance with the highest requirements of the dental colleges incident to obtaining the diploma in dental surgery, and by endeavoring to circumscribe admission to practice to those persons only who were known to possess superior qualifications and excellent character. Providing a varied course of lectures or dissertations, especially suited to our profession, accompanied by practical illustrations or demonstrations. The work to which the society was devoted is thus shown to have been purely one of education and development. How far the design has been carried out must be left for others to judge, but the results which have appeared in printed form indicate that the spirit which was imbued at its creation still lives and moves.

Pass we next to notice the passage of the act for the creation and

incorporation of the Dental Society of the State of New York, and for regulating the practice of dentistry. This was the first or one of the first legislative acts of the kind, and is a monument to the wisdom and energy of Amos Westcott, of which his friends may well be proud. After designating the manner of organizing the society, and granting powers to the censors for issuing licenses to practice to persons found to be duly qualified, the act provided that the Dental Society of the State of New York should be entitled to all the privileges and immunities granted to the medical societies of the State. The younger son had come of age, and been declared by the competent authority to be on a footing of equality with his elder brother. Immediate response was made to the legislative action by the formation, in consonance with the legal requirements, of the authorized societies. Recent inquiry affords information of the valuable results flowing from these organizations, the society in New York City being especially active and useful

The code of ethics of the American Dental Association was compiled and its adoption secured chiefly through the efforts of Dr. John Allen. The highest professional body having deliberately adopted this code and having required its acceptance by all its constituent local societies, and the State Dental Society of New York having ratified this action, as well as most of the dental societies in the United States, it may be taken to be an authoritative utterance of the dental profession in America. This document defined the position of dentistry, in express terms, as "a specialty in medical science" "limited to diseases of the teeth and mouth." Recognizing the superiority of the physician in regard to diseases of the general system, it asserts for the dentist his claim to equal respect for his higher attainments in his specialty. At the same time, the precepts enjoined in relation to professional character and deportment are such as must commend themselves to every dentist possessed of a proper ideal of the duties and dignity of his position.

The sketch, lightly traced, of phases of advancement in the history of dentistry in New York may serve to indicate a similar development in others of our large cities. The multiplication of dental colleges, if not an unmixed good, has served at least to bring facilities for instruction and training within the reach of a large number of students. It may, however, well be asked, Might not a smaller number of colleges, better supported, effect more satisfactory results? More and better labor can be generally obtained from a small number of well-developed individuals than from a host of starvelings. While a certain amount of emulation may be desirable, a competition which descends to the verge of a struggle for existence can be productive of no good. Dental societies have sprung up in every quarter where two or three might

gather together, and if their proceedings are not always of the most valuable character they serve at least (to borrow a favorite expression of a well-known practitioner) as a means for letting out the darkness. The contributions to dental literature on the part of the American Dental Association, of the Odontographic Society of Philadelphia, and the Odontological Society of New York, as well as occasional utterances from other bodies which it would be tedious to enumerate, have been respectable, and often valuable. The productions of such writers as Arthur, Taft, Garretson, Flagg, Judd, Watt, Wildman, not to mention many occasional contributors to the periodical literature, have tended to enlarge and correct former views and methods of treatment and practice, while the contributions toward improvement in all classes of operations form a common fund of brilliant and useful inventions, most important of which are the dental engines of various designs, and the application of electricity as a motor to the distinct classes of instruments designed for the preparation of cases of dental caries, or the subsequent consolidation of metallic fillings. But such a crowd of useful novelties present themselves to the mind on the threshold of this department, that it is impossible to take particular cognizance of them. If, then, all has not been done that might have been during the past ten years for the greater advancement of the dental profession in the United States, so much has been attained as to encourage high anticipations for the future, and the most fitting use to be made of the position gained would be to build upon this foundation a superstructure which may in the future attain to proportions beyond our highest aspirations of to-day. The large number of our dental societies, and the very mixed character of the membership which they represent, their newness, and also the youth of most of the dental colleges, of all of which the majority have come into existence within the present decade, indicate a rawness and incongruity of elements, which time, with the action of proper disciplinary forces, may and doubtless will convert into powerful organizations, which, wisely governed and directed, may secure the most valuable results. And to this work of discipline and direction to-day is necessary the calm and deliberate judgment of the combined wisdom of our profession. Where are the men who are fit to take the lead in this movement and conduct us into the haven where we would be?

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society held at the residence of Dr. W. A. Bronson, No. 8 East Thirty-fourth Street, Tuesday evening, January 13th, 1876.

President A. L. Northrop in the chair.

On motion, Dr. J. Smith Dodge, Jr., was invited to read the following paper, entitled "The Extraction of Permanent Teeth in Childhood."

The period of life which is here meant by childhood extends from about the seventh to about the seventeenth year; that is, from the time when the earliest permanent teeth may be seriously diseased to the time when the full number of permanent teeth should be present in the mouth. It is not the object of this paper to treat of all possible cases requiring the extraction of permanent teeth in these years, but of certain familiar and important conditions belonging especially to childhood, and affecting almost exclusively the first molars and the bicusps. The subject naturally divides into two parts, each belonging more particularly to one of these classes of teeth, but both to be governed by one great principle, which the present essay is specially intended to emphasize. Let us begin with the first molars, and take first of all a survey of the facts in the case.

The first permanent molars are well known to be very subject to early and rapid decay. They are formed during the first years of life, which are so often disturbed by serious disease; and they take their places in the mouth at a time when it is just about to be greatly irritated by the loss of deciduous and the eruption of permanent teeth. It is therefore only in the exceptional cases of sound and continuous health that these teeth escape decay at an early age; and the dentist has almost daily to decide whether he should, in a given case, attempt to save these delicate teeth by filling or at once remove them. Of course, the decision must rest on many grounds. There may be any stage of decay, from the smallest perceivable to a total destruction of the crown. The child may have had no consciousness of disorder, or it may have long felt uneasiness, or there may be at present severe suffering. The dentist may have any theory about these teeth, from the extreme view that they are meant to be lost and must always come out, to the other extreme view that the mouth is forever mutilated by their loss and they must be kept at all hazards. Add to these the dentist's secret trust or distrust of his own ability to fill bad cases with success, and we have probably the most usual factors in determining that the tooth in question must or must not come out. And yet a decision made on any or all of these grounds may be faulty, because it fails to make account of a much broader principle which is of the first importance. And it is for the sake of this principle, as has been said, that the present paper is read to you. When the dentist has examined every side of the tooth, has inquired about its feelings, and has satisfied himself whether he can make a creditable filling in it, or even when he has gone over in his mind his favorite theory about the sixth-year molars, he still has not looked squarely at the question

before him. The tooth on which he fixes his attention is not an integer, but a fraction; or in other words, a tooth by itself is not an organ of the human body, but a thirty-second part of an organ. What function can a solitary tooth perform? It cannot chew, it cannot help in speech, it adds nothing to the owner's beauty. It is mere rubbish because it is alone. But give it only one antagonist on which it may squarely bite, and the value of the pair is immense for the chief dental function, mastication. And in proportion as the number and the natural relation of the teeth in any mouth approaches what is normal, in that proportion is the value of each increased. The dental organ, then, is not *a tooth*, but a *set of teeth*, and one tooth is no more an organ to be considered by itself than one ventricle of the heart, or one rib. Until the dentist enters fully into this view, he has not gained the freedom of his profession; but when he has once come to regard the denture as a whole in determining the requirements of each part, then he begins fairly to see what is the question presented by each case. He quite throws away that superstition which makes it his duty to preserve each particular tooth at all hazards, or to condemn any tooth in which he could not make a first-class filling; and he no longer asks himself, "What can I do to save this tooth?" but, "How can I best preserve or restore the dental functions in this mouth?" If this question is so answered as to demand the loss of the tooth, he pulls it out with as little compunction as he would feel in cutting away a margin of gum or an overhanging cusp which interfered with some difficult filling. Or if, on the other hand, this question convinces him of the importance of saving the tooth in question, he will lavish time and skill on the most unpromising snag, and feel well content with the best result attainable, although it be far from ideal perfection. And now let us take up some of the considerations which this broader view of our duty suggests, with direct reference to the permanent molars. The law which guides their development is a magnificent piece of nature's strategy. The time is approaching when the small, frail teeth of infancy must make way for others which shall be equal to the demands of adult life. The body has passed its most critical years and entered on a period of vigorous and rapid growth. The appetite is strong for hearty food, the digestion is vigorous, all parts of the frame are rapidly renewed and enlarged. The perfection and energy of coming years depend on the unbroken continuance of the sturdy digestive process. And this process depends much, for its ease and completeness, on the efficient mastication of the food. How shall the old teeth be exchanged for the new in the very midst of such a period? Is it not dangerously like the proverbial swapping of horses in the middle of a river? In the normal evolution of the dentine, nature provides for this by beginning the whole process with the firm planting of four large new teeth in the

very position where they can most effectually work. These being established and maintained, the others can better be spared, and may in turn grow sore and fall away without hindering the daily mastication. It is a change of front in face of the enemy; and the wise general begins that operation by establishing some of his best troops in an impregnable position. But if any interferes to threaten the normal process with defeat, the dentist's duty requires him to lend his aid, not to this or that tooth *per se*, but to the threatened function of mastication. In most cases, but not in all, this help will consist in preserving the diseased tooth. He may have what fancy he will about the ultimate destiny of these teeth; *now* they are imperatively needed. He may be able to make the handsomest of gold fillings, or only to work in some gutta-percha over a layer of softened dentine: no matter, any thing to save the mastication; the tooth and the future are alike of minor importance; *now* this child must be able to chew, and so the tooth is somehow saved. But in the very next case, it may happen that this same rule will dictate very different treatment. The tooth comes to you with an alveolar abscess, or you make one in the course of your efforts to save it, or without actual abscess the roots of the tooth are sore and persistently uncomfortable. In the child's father you would take plenty of time and cure the disease; but it makes a vast difference that it is the child's tooth and not the father's. The child must chew, and there is not possible a more effectual hindrance to chewing than a sore tooth. Let a child have one or two teeth which hurt if he uses them, and of course his food goes to his stomach simply bitten into lumps, and all the strain and waste of difficult digestion follow. Besides, the child is now forming habits of all kinds, and will readily form the habit of swallowing his food unchewed, if for awhile he is compelled to do this by a painful tooth. Again, the effect of continued irritation on the nervous system is peculiarly mischievous, and it is a common thing for parents to say that a child is almost sick from the constant pain it has suffered for a few days in some teeth. When one remembers the children's mouths he has seen full of sore and tender teeth which will hardly bear the dentist's lightest touch, and which have for weeks and months been in this state, and when he remembers, too, how slight a local disturbance is sometimes enough to convulse the entire system of a nervous child, it will not be hard to convince such an observer that serious mischief may be ignorantly done to a child by allowing even one tooth to remain a source of slight but constant irritation. For all these reasons it is my carefully-formed opinion that many teeth ought to be extracted from the mouths of children which it would be malpractice to extract if the patient were adult. In this case as in the other, although the result is just the opposite, the guiding principle is the same. The question always is,

not, "Can I save this tooth?" but, "How can I bring the function of this denture nearest to its normal state?"

Now, if we turn to the second division of the subject, which relates almost exclusively to the bicuspid, we have to consider a very different order of facts, but one whose solution must still be found in the same principle,—namely, that the dental organ is not a *tooth*, but a *set of teeth*. The condition which generally suggests the extraction of bicuspid in childhood, and of which alone this paper speaks, is irregularity in the position of the teeth, and more particularly of the six front teeth in either jaw. The molars of the permanent set come into the mouth one by one, and find each a place hitherto unoccupied, and made ready for it by the growth of the jaw. In general, therefore, there is little irregularity in their position. The bicuspid replace teeth of slightly greater antero-posterior diameter, which therefore commonly preserve for the successors an ample space. Of course, any tooth whatever may be out of place, and in extreme cases all the teeth in a mouth may stand amiss, but for the reasons recited the subject of irregular dentition belongs by far the most largely to the incisors and canines. The secondary reasons for this are obvious enough, while the primary causes are very obscure and difficult to trace. The least examination of a child's jaw, dissected, will show how delicate a process nature has here undertaken. The germs of the permanent front teeth seem to be thrust into any available space between or beyond the roots of the deciduous, without much regard for the order they are ultimately to occupy, so that if this arrangement were shown side by side with one of those round and perfect sets of teeth which it is so refreshing to examine, and if the suggestion were made to a novice that the one order was expected to develop into the other, he would pronounce it impossible, or at least would say the artifice was exceedingly clumsy and unpromising. Nothing but daily experience of the regularity and certainty with which these growing teeth find their way successfully into the places for which they are designed could convince us that this is just the proper method of development. But obviously this result depends on an extremely nice balance of forces. Each tooth must grow at a certain rate, each must meet with such and such resistance, correlative processes of growth in the alveolar margin and absorption of the deciduous roots must proceed in due proportion to the growth of the new teeth, with probably other elements of propulsion and direction which are little known to us, in order to produce the beautiful result so little suggested by the beginning. It is plain that among the many ill chances of the child's life, this nice balance will often be disturbed, and any disturbance tends at once to irregularity. We are all familiar with such disturbances as arise from the too early loss or too great persistence of the first teeth. We have all seen permanent teeth de-

layed for some inscrutable reason beyond the due time of their eruption, and find at last that their more energetic neighbors had seriously encroached on the vacant space. But we do not dwell on these cases when our thoughts turn to the causes of irregularity. By far the most obvious and troublesome cause, and one that lies quite beyond our present comprehension, is the deficient development of the alveolus, or, more strictly speaking, of the entire jaw. A single glance shows that the real trouble is a disproportion between the space which the teeth need and that which they find. There are too many teeth for the jaw, or too little jaw for the teeth. Who will teach us how to account for this? The cases, pro and con, so candidly related in Dr. N. W. Kingsley's interesting paper on the subject seem to me so conflicting that they can hardly be said to establish the theory which he suggests, and which, if established, would leave still many questions to be asked. The much older explanation, that, in consequence of the numerous and rapid mixtures of blood among our people, most children are liable, under the unfathomable caprices of heredity, to inherit the jaw of one type of ancestry with the teeth of another, seems to me, so far as it goes, sound and satisfactory, and yet one feels that it hardly reaches all the cases met in practice. Perhaps a little additional light may be gained by considering that the methods of development for the teeth and for the jaw have one essential difference. The teeth, after their consolidation begins, grow centrifugally. The exterior surface of the dentine, and thereby the size of the tooth's crown, are fixed in early infancy. Subsequent interference with the process of growth may make the most vital difference in the structure and value of the teeth, but it can make no difference in their size; while these same constitutional disturbances, interrupting throughout the body the process of nutrition, more or less arrest the peripheral growth of the jaw and actually diminish the size it is destined to attain. The same systemic trouble which produces faulty structure without fault of size in the teeth produces faulty size in the jaw which is to accommodate those teeth. I have not worked out this idea by a sufficiently wide observation of cases, but it is strongly impressed on my mind that some serious interruption of general growth in infancy may often explain the disproportion between jaw and teeth. To return from this digression, whatever may be the relative importance or the truth of these causes, the fact is that we are constantly called upon to correct the position of teeth which are misplaced, generally, although certainly not always, because they have not room to stand aright. Very commonly it is plain that the forceps would simply and speedily remedy the trouble, and the dentists of the last generation had no hesitation in applying this ready relief. I suspect, too, that those of them that remain will not easily be persuaded that there is any other way so good among all

the modern improvements. It is beautiful to see how smoothly and quickly the remaining teeth, in cases of moderate deformity, disentangle themselves, and fall into regular line, when once the pressure has been taken off by extraction, and consequently it was until recent years the unquestioned practice. But more lately there has come to be a strong tendency to preserve all teeth, an exaggeration of that conservative instinct which lies at the bottom of our art, and to get them into line by "expanding the arch,"—that is to say, by pushing them outward until they stand upon a curve large enough for all to range evenly side by side. I do not see how any dentist who has in mind the bold, full curve of a normally developed jaw, with its sixteen perfect teeth in easy and beautiful order, can fail to be impressed with this idea. If we can transform this pinched mouth, with its twisted, ill-set teeth, into such a beautiful form, surely it will be a triumph of dental art in which every dentist will delight. But I believe it is not often that this can be done. It seems to me this is one of those numerous cases in which the typical ideal, being once lost, can hardly be regained; and the process of remedy must consist in supplying the best substitute which intrinsic and surrounding conditions permit. In the perfect jaw the sixteen teeth stand in a beautiful curve, each slightly separated from its neighbors, or touching them so gently that all can yield to the force of mastication with a slight radial motion, and each receives the blow of the antagonizing teeth almost in the direction of its length. These conditions cannot be produced by expanding a narrow arch. The crowns may sometimes be brought into nearly or quite the normal curve, but there long remains a tendency to revert to the original malposition, which keeps them crowded tightly together; and, since the apex of the root remains a fixed point, the teeth stand obliquely, instead of vertically, and receive the force of chewing in a direction partly across their long diameter. These are grave differences from the typical denture, and so radical are they that probably, if all those who have labored in this direction would candidly state their whole experience and the secret impression which it has made on them, there would appear a large preponderance of disappointment and failure. I do not see how it could be otherwise. The typical mouth is made *ab initio*, it is round and full, and its teeth are in perfect order, because all influences have *from the first* happily combined to produce this result. Equally the faulty denture dates back to the early stages of growth. Now, how shall the dentist, by a little mechanical apparatus and in a few months, correct this innate wrong? He may force the *teeth* outward in a body, but how shall he alter the configuration of the maxillary and other facial bones? That he does not eradicate the fault is proved by the fact already mentioned, that an expanded arch tends for a long time to revert to its original condition, tooth by tooth, showing that

the forces which caused irregularity are not eliminated, but only counteracted. For my own part, after considerable observation and a good deal of thought, I have degraded the expansion of the arch from the position of a cardinal principle to that of an occasional expedient, and have recently begun to extract teeth for the correction of irregularity much more freely than I formerly did, and it only remains to give the reasons for this course to have covered the ground contemplated in the title of this essay. And first let me state what this old process is which is here advocated. It applies, of course, only to those cases in which irregularity is the obvious result of disproportion between the denture and the jaw. The correction begins by removing this disproportion by extracting a tooth or teeth. After that, plainly, the case is wholly different. If any further interference is needed, it aims merely to readjust the teeth within a space sufficient for them all. Almost always the bicuspid is the tooth removed, and the first bicuspid is oftener than the second. The reason is that they are near enough the seat of trouble to accomplish what is wanted, and the loss of them does not make any such change in the appearance of the mouth as would be made by removing teeth farther forward. If one bicuspid is worse than the other, either by deformity or decay, of course that one is extracted; and so, if the first molar is badly decayed or very much malformed, it may answer to remove that instead of a bicuspid. But other things being equal, the first bicuspid best meets the need. Very commonly, in cases of small deformity, no further treatment is required. In a few months the vacancy is occupied, the irregular teeth have taken their regular places, and only a dentist could detect the loss. In other cases apparatus must be applied to bring the teeth into place, but the whole process goes on rapidly and easily, because the principal obstacle is removed. Perhaps I should apologize for rehearsing such familiar facts as these, but it is well to be definite in stating exactly what practice one is advocating. This is, in fact, accepting the narrow arch, either wholly or in great part, as the result of causes so remote and of such long standing that the attempt to remedy it can have only a partial and apparent success.

And now for the reasons which uphold this course. The first is its *simplicity and promptness*. Regulating cases are proverbial among dentists as being tedious and provoking. The apparatus will not work exactly as you expected, either through its own defects or through the willfulness or neglect of the patient. Month after month the case drags its slow length along, until all parties get desperately tired of it, and generally something less than the ideal perfection is accepted as the best attainable issue. And when the case is done and dismissed, which of you will look into that mouth the next year without a sickening apprehension that he is going to find those teeth half-way back to their original posi-

tion? But if this is weary and disheartening to the dentist, who sees it two or three times a week, what must it be for the patient, who has it for his daily and nightly occupation? And yet all this would be no valid objection if one felt sure that he was working in exactly the right way. But it is exasperating if we suspect all the time that the way is radically wrong. The first idea is that expanding the arch is working on nature's plan; but nature fights it at every step. In fact, the determining conditions are far beyond our reach. They are natural forces, however ill adjusted, which have made this a narrow arch, and therefore, as the case stands, the narrow arch is natural here. If the deformity is extreme, we must combat nature's mistake, as we do in correcting a squint or a club-foot; but it is well to know our antagonist, and not enter lightly on so desperate a conflict. Now compare the result of accepting wholly or mostly the narrow arch, and adapting the denture to it. Nature helps us. The teeth take kindly to their new positions, seem almost to seek them, and remain readily. The long irritation of teeth and mouth, which cannot fail to be injurious to a growing child, is done away or greatly abridged, and the usual uncleanness of the mouth which more or less accompanies regulating apparatus, and which has often led to decay, is in proportion avoided. I mean, therefore, much more than the convenience of the dentist when I say the first reason for adopting this method is its simplicity. The second reason is that *it takes off the lateral pressure from the teeth*. One great reason for interfering at all is that crowded teeth are subject to a mutual pressure which makes it difficult to clean them, and tends to break down the enamel and induce decay at the points of contact. The only change in this condition made by expanding the arch is that the points of contact are changed. The constant tendency of the teeth to get back into their old places keeps them tightly pressed together, and after a few years the danger of approximal decay must be faced and fought. The result of extraction is very different. It eases up every tooth, takes off the strain, gives the toothpick easy access at every space. Those who have seen in adults mouths which in childhood were cared for by Dr. Eleazer Parmly or Dr. E. J. Dunning, may have wondered at the frequent gaps, but have not failed to admire their striking cleanliness and efficiency, the result not more of instruction about cleaning the teeth than of a practice which made it easy to obey. While those who, like myself, began practice with a superstitious reverence for everything in the form of a tooth, must, like me, have often sighed as they toiled at doubtful approximal fillings in a crowded mouth to think how much wiser it would have been to have eased this pressure long ago by taking out a tooth.

Now, all this is but the application of the same principle which has occupied us already,—the single tooth is nothing, the function is every-

thing. Many teeth or few, wide arch or narrow, that is the best mouth which eats and speaks best, and he is the wisest dentist who most surely reaches these results.

The conclusion of the whole matter, then, is, that in our care of children's mouths we are to rise above the mechanism of filling teeth, and study the total welfare of the patient's dental functions. All questions of detail are to submit themselves to this general consideration, which will make us sometimes so conservative that the superficial men will laugh at us, and at other times lead us to measures which the same critics will call rash and radical. And yet all the while this method is simply common sense guided by scientific judgment. Our patients have far less care for great operations or for individual teeth than we think. They want to eat and talk with efficiency and comfort, and perhaps to show handsome teeth, but beyond this they can seldom be persuaded to take any lasting interest; and if you have their full confidence, you may chisel and bore and plug and extract, with scarce a question, unless it hurts. No man deserves such confidence unless he seeks before all else that which his patient seeks in employing him, the greatest possible perfection, not of any single tooth, but of the dental functions. And the man who with brains and conscience and professional skill serves his patients upon this principle, will deserve and will receive the lasting gratitude and confidence of all who seek his help.

Discussion.

Dr. N. W. Kingsley. It is with great diffidence that I rise to follow Dr. Dodge, for the reason that I have never listened to an address from him on any subject that was not prepared with consummate care; evincing such a profound knowledge of the subject, and presented with such an elegance of diction, that it seems to leave nothing to be added, and that whatever might be said would have a tendency to spoil the good impression that his essay has certainly made, rather than to improve it. Nevertheless there were topics only touched upon in his paper, to which, as you are aware, I have given much thought and attention, and to which I desire to call your further attention. In speaking of certain irregularities in the development of the teeth, Dr. Dodge says, they are recondite and remote, and he makes reference to the paper I read upon this subject before this society more than a year ago. I am not surprised that Dr. Dodge should regard the statements of that paper as bearing a seeming inconsistency. At the time of its preparation, my own ideas of the results of my investigation were necessarily more crude than they are at this time, having now had a longer period in which to digest them. But with all the possible crudity of that presentation, I still think that the observations and the facts there narrated point to but one conclusion. Laying aside

such irregularities in the position of the teeth as are manifestly due to causes accidental or mechanical, acting after eruption, and that class of irregularities which unquestionably come from the mixing of discordant types, I still think that any considerable malformation of the dental arch is due to certain neural disturbances operating in the early life of the child, or having their origin in a like cause among the ancestry, the results of which are transmitted to posterity; and that these disturbances are only found associated with the highest forms of civilization. If such be the fact, we can readily see that parents without a hereditary taint of this description, may, by their manner of life, easily beget in their children a predisposition to a nervous condition in which the physical system may remain tardy and undeveloped; and teeth fully formed in their diameters may emerge from undeveloped jaws in a crowded and malformed arch; and that such an irregularity originating in such a manner is more likely to be transmitted to the next generation than it is to be obliterated, except extraordinary care is taken to counteract such a result.

I believe, also, that in the case of those children where there is a positive hereditary tendency to a malformation of this kind, very much may be done to counteract or prevent it. I believe that in my own children I have seen a proof of this. In the elder one, now ten years of age, I saw, six years ago, when she was four years of age, that the superior central incisors were becoming quite loose. I became anxious about the matter, and watched them with much care; within a very few months both crowns fell out, the roots being entirely absorbed. As she was then but four and a half years of age, and it would be three years before the permanent incisors could be expected, I naturally became anxious for the results. Under the theories then almost universally held, of contraction of the alveolar arch consequent upon the loss of the temporary teeth, I looked for an approximation of the lateral incisors, a narrowing of the space between them, and an ultimate irregularity in the positions of the permanent centrals as certain to follow. Realizing that the only remedy must come from an ample development of the jaw previous to the time of their eruption, I set about the application of such laws of hygiene as would be likely to produce such a result. The child was, and is, of a highly excitable nervous organization, such a one as requires extraordinary care to keep the physical equal to the mental development. She was not fed on oat-meal and bran bread,—which one would gather from the speeches we have listened to so often as the only proper food to make teeth of,—but she was fed on strong, healthy diet of meats and vegetables, and took plenty of exercise. Not a day passed that she did not have her beefsteak,—not burned by the fire until the juices were all gone, but carefully prepared so as to give her the best of nourishment. She was not sent to

school at four years of age, as her father was, nor for more than three years afterwards; the object of which was that there should be no tax upon the nervous system which should divert the physical development. The result was a growth of physical frame, at the present time in advance of most children of her age. The permanent teeth of both jaws, forward of the molars, have all erupted, canines included, although, as it will be remembered, she is but ten years of age.

These teeth all made their appearance very much in advance of the average time of their appearance in other children, but the simultaneous development of the alveolar arch and jaw were equal to the emergency. Every tooth is in its position, the arch is symmetrical, and there is no irregularity. I believe that if six years ago a different course of treatment had been pursued, a different result would have followed. For example, if the physical development had been neglected, and the life of the child had been such as to excite and stimulate the nervous system rather than retard it, we should have seen the emergence of the teeth probably at much the same time as they did appear, but in contracted and undeveloped jaws, and consequently in a crowded and irregular position. This experience with the elder child suggested that the same kind of care and attention should be begun at a much earlier age with the second child, now six years of age. This care for her physical development began at the very earliest period of her life; a strong, vigorous, healthy, cheerful nurse was hired for her, and as soon as the child needed other food the same nourishment was provided as for the elder, and the child, although a girl, for the first four years of her life was more like a tough, vigorous boy than a girl. She was well developed in bone and muscle, consequently and necessarily before she arrived at her present age the jaws began to expand, until quite wide spaces are to be found between nearly all the teeth. Only the incisors below have been shed, and the permanent incisors have taken their places with regularity. In the upper jaw there is already ample space between the lateral incisors for the large permanent centrals which are to follow, thus precluding all possibility of a crowded position.

There is another point in Dr. Dodge's paper to which I wish dentists would give more attention than they have of late. It has become somewhat fashionable to decry the extraction of teeth under any circumstances, and particularly in treating irregularities. An idea seems to be prevalent that no matter how crowded and jumbled the teeth may be in a narrowed arch, the arch must be enlarged and all the teeth must be brought into line. It is very possible that I have contributed as much to the prevalence of this error as any one, but I wish to improve this opportunity to state that the idea that all the teeth must be brought into line under all circumstances, to produce

symmetry and harmony of feature, I regard as a very gross error. My own experience is ample to confirm me positively in my views. For example, there came to me as a patient a young man with the superior lateral incisors shutting within the lower jaw,—the central incisors, canines, and bicuspid teeth were in contact and on the true line of the dental arch. The articulation with the lower teeth was good, the lower jaw was well developed, the dental arch regular, the profile of the face was good, the features were symmetrical, and there was no deformity save the lateral incisors before referred to, which were entirely within the dental arch.

This patient was brought to me under circumstances in which my pride was appealed to, to show what skill I was master of in bringing those lateral incisors into their normal position. You will bear in mind that the superior dental arch was already full, and articulated admirably with a well-developed lower jaw. To spread the superior arch sufficiently to bring these teeth into line would break up the articulation and induce a deformity not second to the one already existing. The six-year-old molars were somewhat decayed, but the pulps were not exposed. I decided to extract them for the reason as before stated; to enlarge the arch with all the teeth in would induce a deformity. These molars were selected for extraction because they were the most defective teeth of the arch. Steps were taken immediately to carry back the canines and bicuspid along the line of articulation, and bring the laterals into their position. A number of months were spent in the effort; the work was accomplished; the arch is regular, the articulation is good, and it is scientifically a success, but professionally it was bad practice,—it was a professional mistake. That some of the teeth must be extracted to correct the deformity was certain, but under the circumstances the molar teeth should have been saved and the offending lateral incisors removed. I don't wish this case to be taken as an example of the opinion that I would give as the best course to pursue in another case where the lateral incisors were within the arch, and which would come under much the same description. I have in other cases moved the lateral incisors out into line, and regarded the treatment as the very best that could be pursued, but in the case of the canines and centrals being in contact,—a regular arch, a young man, and all the teeth sound and healthy,—I say it would have been wiser to extract the lateral incisors than subject him to all the treatment which followed. The removal of the lateral incisors would never have positively disfigured his mouth, and their absence under the circumstances would never have disagreeably affected the expression of his face. I relate this case for two reasons: first, to show the necessity of extraction under certain circumstances for the treatment of irregularities; and, secondly, to show that what is possible to accom-

plish under scientific skill may not always be for the chief good of the patient. In this sense I call it a failure. Another case comes to my mind which illustrates the impropriety of attempting to spread a superior dental arch to the measures of the inferior arch. It was that of a young lady with a symmetrical lower jaw, giving no appearance externally of undue width. The upper jaw was narrowed and V-shaped. I attempted the spreading of the upper jaw, so that the bicuspid and molars should articulate naturally with the lower teeth. As the work progressed I saw that their crowns were becoming tipped, and their articulating surface would not occlude with their antagonists. The reason of this was that the apices of the roots were based upon a narrow maxilla, and the age of the patient precluded any hope of enlarging it. The bicuspid and molars were spread to the verge of the possibility of their usefulness, but not sufficient to enlarge the arch enough to reduce the pointed position of the incisors. To bring about this reduction the extraction of a bicuspid on each side was essential. The cases have been so many in my practice, where I have regarded the extraction of certain teeth as essential to symmetry as well as utility, that I should only weary you with their relation.

Dr. W. H. Atkinson. So far as the remarks made this evening favor a broad preparation and thorough acquaintance with principles as requisite to practice, *that* I would emphasize with all my heart; but to consent to following the lead of some old operators, who have asserted it was "a sin to leave the first permanent molars in the mouth of a child," which sentiment seems to be sustained by the paper just read, would be doing myself an injustice, and advocate a doctrine that would be injurious in its results to the profession. If I were to enter into this question at all, I would take it up ethnologically, and pursue it by the assistance of histological research.

The essayist of the evening introduced an analogy between the rib and a tooth, as portions of an organ, which I regard as fanciful, far-fetched, gratuitous, and utterly untrue as to the nature of development and use of rib and tooth. In so far as the analogy has any value, it is a pronounced "caveat" against the removal of any portion of the organ of mastication and speech.

The teeth are themselves very peculiar organs, the unbroken series of which constitutes the masticatory and phonetic apparatus, the integuments of which (the teeth) are not reproduced after removal.

The alveolar processes are not formed alone, or without the presence of teeth, but by a concurrent process of growth *pari passu* with the teeth.

A tooth may be perfectly developed without having made its *appearance* in a normal or abnormal position; the tooth would nevertheless be complete, and its occult presence we could only surmise by our ac-

quaintance with the typical formula belonging to the mouth under inspection; in fact, it is the constancy of type that gives us a basis upon which to found our diagnosis and prognosis of the cases we endeavor to bring to a happy issue.

All the teeth are requisite to complete the apparatus, but they are not all equally important in the exercise of the function for which the apparatus is formulated.

An organ may be made up of diverse or similar elements, in accordance with its intended use or function; the masticatory apparatus of the human system is made up of four classes of organs, or factors of function, viz., incisors, cuspids, bicuspid, and molars; while the biliary apparatus consists of a congeries of cells, any one of which is as positively a bile-producer as a cluster, lobe, or entire liver would be, and we ought to be careful in our statements when we are speaking before young men, who are liable to be misled by the use of loose and fanciful nomenclature.

Have we not come to premature conclusions when we assert that "irregularity depends upon the inheritance of the teeth from one parent, and the jaws and alveoli from the other"? I take it that the progeny of parents is an equation by confluence of the two types, very much like the different notes in music, all potentially present, but the predominant one most clearly perceived.

It is this predominance of symbolization of type that marks special resemblance to one or the other side of progenitors. What has been called habit, or training, is one of the essential enabling circumstances of conformation of body to type. Exercise being essential to development, should be equable, regular, and steady to secure such satisfactory blending of types as to express an equality of similitude to each of the parent stocks.

The mistake is, to suppose that type has its ghost hid away in the embryonal mass in one corner for the tooth, and in another corner for the jaws, so that when they come together, the alveoli are too small in capacity to accommodate the roots destined to be implanted therein.

To discuss this question we must study embryology, and to study this satisfactorily the rules of hybridization must be closely scrutinized, and, as there is but one genus and one species "*homo*," we have no human mules proper.

We call the progeny resultant upon copulative conjunction of the male "*equus*" and the female "*asinus*" a mule. This foal is neither horse nor ass, but it is "an 'alf an' 'alf" all the way through to the tips of the hairs. Just so are our children, teeth and all, the resultants, the confluence of diverse parental activities.

I indorse the general philosophy and intent of the paper, and the modest manner in which it has been presented, but it is not the highest

exercise of our intelligence to be a mutual admiration society, and make most note of the points in which we agree, and felicitate ourselves upon the scholarly manner of their presentment. Let us rather point out where we disagree, that we may complement and render effectual the efforts of each to get at the truth.

Then, what is the cause of irregularity? We would have to go a good way to find out satisfactorily the answer to this query. One of its most potent antecedents is want of legitimate exercise in both parent and child. Legitimate exercise of the jaws and teeth in the children of fashionable society is wellnigh an impossibility. The soft, sloppy, spoon-victuals upon which these children are reared renders mastication unnecessary and irksome, therefore the food is swallowed without vigorous use of the jaws, by the neglect of which they only attain a minified development.

In all this I would advise just the reverse course to be pursued; that is, I would feed them upon food that demands long-continued and vigorous chewing and thorough insalivation to render it of easy deglutition.

Any child that is born, and once vigorously takes breath (without there is some special organic deficiency), may be developed by proper management up to the full measure of ancestral type.

So far as conscience has any business anywhere, it is most pronouncedly demanded in dentistry. Nevertheless, conscience alone does not constitute competency. Conscience uncoupled with intelligence is as inefficient for good as would be the latter without the former,—a *failure*, a *void*. Let us have conscience and intelligence, then, together, and let them be exercised all the time.

I don't know about our being so much wiser than our predecessors, neither do I indorse their being much wiser than we. We have to deal with deteriorations that they knew nothing of; that, I think, has been ignored too much in our past investigations, as well as in our present discussion.

Every case falls into the care of some individual practitioner, who has the responsibility, consciously or unconsciously, laid upon him, and I esteem that as one of the essential points.

He must decide as to the propriety or impropriety, under all the circumstances, of removing a permanent tooth from the mouth of a child, for the prospective good of the patient.

I would end my remarks by saying that he is master of the situation, and if he feels that that is not so in his own consciousness, let him cast about for some one who is, to whom he may apply for direction.

Dr. W. H. Dwinelle. I realize how much I have lost by not being here in time to hear all of Dr. Dodge's interesting paper. From what I have heard of it, I regard it as one of the ablest ever read before this

association. In responding to the call to speak on the subject of the paper, I do so with reluctance, for two reasons: In the first place, I am not qualified to do so, for I have heard only a portion of it; and in the second, for the reason that I am opposed to the general spirit and doctrine of the paper, as I understand it. Yet, after all, this latter reason is not valid.

It is best we should not all agree on all matters that are not yet fully defined and established; if we all thought alike, there would be no further inquiry, investigation, progress, or enthusiasm; everything would be at a dead level.

I believe in the magnetism of contact, in the clashing together of sharp differences of honest opinion, by which new truths, new principles, and discoveries are evolved. I will speak only in a general way on this subject. I have always taken issue with the advocacy of removing sound teeth for the purpose of regulating, except under the most extraordinary circumstances; by sound teeth, I mean those that are already sound or can be made so.

I have no sympathy with those who regard the sixth-year molars as guilty things, having no right to the place assigned them, and who think that they should be cast out and regarded as evidence against the wisdom and design of the Infinite.

I believe the Creator placed thirty-two teeth in the mouth with the intention of their remaining there, and that no one of them can be lost without injury to the body politic; that it is the province of our art to come to the rescue, and retain, and not destroy them.

In cases of irregularity we are not justified in extracting, but should expand the arch, thus enabling the teeth to fall into their normal places. To extract under these circumstances has a tendency to contract the arch, thereby taking a step in the wrong direction, and away from nature and her manifest type. On the other hand, if the arch is expanded the normal circle is recovered, and the original type preserved.

Much has been said about the danger of contact and consequent decay of the approximal surfaces of the teeth. Extraction of the teeth is proposed as a remedy, especially the sixth-year molars, but it is admitted that the narrow arch is very likely to be associated with the advantage gained. By expanding the arch we gain all the space that is desirable, while we retain all of the teeth. By these processes we are simply getting back to nature, who is ever at work with her silent force endeavoring to overcome any deviation from her laws of harmony and of order; who always takes kindly to our assistance, and is ever ready to co-operate with us and aid us to that end. It is objected, in the paper of to-night, that when the teeth are regulated they have a constant tendency to go back to their condition of irregularity. Whenever this does occur, it arises from a mistaken idea of the mechanical princi-

ples which should underlie the proper regulating of the teeth. With few exceptions, in cases of irregularity the upper and lower teeth are matrices to each other, confirming the irregularity of each; so that often it is quite as important to expand the lower jaw as well as the upper. If the upper teeth are expanded to their normal circuit, and articulated to the false matrix of the lower, they will be very likely, if left to themselves, to gravitate back to their original condition of deformity; whereas, if the lower jaw is expanded to a true matrix, both upper and lower teeth will remain in their normal restored condition.

In regulating teeth of this character, it is well to wear both an upper and lower retaining-plate for awhile, until the teeth have become established in their places.

During those years when contact would be injurious, we are justified in expanding the arch; after that time contact is not likely to be injurious. In any event, it is better to gain space by expanding the arch rather than by sacrificing the teeth and contracting the jaw.

It seems most remarkable that a contracted or narrow arch is boldly advocated here to-night, thus putting in a plea for deformity. It is the peculiar province of our art to correct deformity, not to create and then perpetuate it. To assume that its correction is not possible is but a confession of inability, and to acknowledge our art a failure in one of its most essential departments.

It has been objected that the arch may be expanded too much by bringing all of the teeth into their normal position, and that in so doing you are likely to spread and *splay* them unnaturally. They may sometimes appear so during the process of regulating, but if proper means are resorted to the extremities of the roots of the teeth may be projected forward and the teeth be made to assume their proper vertical position.

This, at least, is the rule. There may be exceptions to it, as in cases of dwarfs, but we are not discussing the exceptions.

The arch may be expanded as well as contracted. If we expand we restore the normal standard: we leave nature to exercise all of her functions. If we contract we deform, cripple, and impair the various organs involved in all of their manifestations. You will always find a thickened and nasal voice associated with a contracted arch. The reverse of this is also true. A broad arch increases the functions of the antrum as a sounding-board, and is almost invariably associated with a voice round and sonorous. We have all remarked how the character and quality of the voice have been improved by regulating the teeth, from a narrow and contracted arch to a broad and normal one. It is claimed as an argument in favor of extracting the teeth to regulate (?) them that it is easier both for operator and patient. So it would be easier to do anything superficially throughout all the departments of our profession. This is the argument of the ease-loving everywhere.

In our profession it despises prolonged and difficult operations; it fills thousands of teeth with amalgam when they should be filled with gold; it tries to persuade itself that gutta-percha and other ephemeral stoppings will in some way become permanent ones; it kills ambition, and stays all progress or advancement.

We have made such great improvements in regulating teeth of late that it takes but little time or endurance compared to what it formerly did, and our late results are far beyond what we ever deemed possible. The fact that several distinguished in our profession freely extracted the sixth-year molars, thus insuring a certain space between the remaining teeth in the narrow arch, has been referred to in justification of the practice.

By this injudicious course of practice one of the individuals referred to has deliberately, and no doubt unintentionally, *manufactured* from fifteen to twenty cases of protrusion of the lower jaw, or *gimber jaw*, as it is sometimes called, to my own knowledge. [Dr. Dwinelle then exhibited casts of mouths thus treated by the person referred to, one of them showing the extraordinary fact that the superior maxillary was so far contracted by the extraction of the two bicuspid and first molars on either side of the jaw, that the twelfth-year molars had come forward and impinged tightly against the cuspids. The result was an unusually bad case of retraction of the upper and protrusion of the lower jaw.] I wish to say, in closing, that I protest, in the name of the Creator and his wisdom, against the wholesale slaughter of the beautiful and valuable organs committed to our charge and protection. We have no right to project the narrow arch into the future. How far these tendencies are transmittible we do not positively know; that they may be transmitted we have many indications that make it very probable.

Dr. N. W. Kingsley. I shall be obliged to differ with Dr. Dwinelle in his opinion that a deformity of the dental arch, induced by maltreatment, as in the case which he has presented, where the arch has contracted from the extraction of teeth, can be transmitted to posterity unless there was a predisposing hereditary taint. I cannot conceive it possible that such results would follow, any more than I should expect to find that children were born blind of parents whose eyes were accidentally plucked out.

Dr. C. E. Francis. So much has been said condemning the practice of extracting teeth regardless of circumstances, that it seems really refreshing to hear an honest word in an opposite direction. I really believe that some of our prominent dentists are so extremely radical in their ideas that, rather than extract a single tooth, they would jeopardize an entire denture. No matter how delicate in structure, or how crowded their position, even though menaced by caries in every direction, still, under no circumstance would they advise the removal of a

tooth. Let me briefly relate one or two cases of recent observation. The last patient who entered my office to-day was a young gentleman about twenty years of age. When about twelve years of age he came with his mother, who wished to know how his teeth could best be preserved for the greatest length of time. He was a delicate-looking youth, with crowded teeth and the sixth-year molars decayed. I advised the removal of these molars. Subsequently I filled a cavity on the grinding surface of each of the twelfth-year molars,—four cavities in all,—and his teeth have had no professional attention since. Upon examining them to-day I found all the teeth in splendid condition, and only one cavity to be filled,—a small cavity in a third molar. Much has been said in regard to the great loss of masticating surface where the first molars are removed early. In the case I have related no suffering has resulted on this account. He is now a tall, healthy-looking young man, of fine physique, and can partake of his rations probably as well as any of us. Now I will relate another case. Two young ladies (sisters) recently presented themselves to me for advice. More crowded, irregular, and ugly sets of teeth than they possess can hardly be imagined; and, although in their “teens,” their teeth are loaded in every direction with gold. Their dentist is one who is totally opposed to extracting sixth-year molars, and loudly declaims against such practice. They came for advice, and I am puzzled to know what advice to give them.

Dr. Corydon Palmer. I have listened with interest to Dr. Dodge's paper upon the subject of the evening, and wish to commend it for its smooth and beautiful style.

I feel that I cannot let the opportunity pass without making an effort to stay the growing tendency to fall back into the modes of the past.

Twenty-five and thirty years ago the practice was to extract to correct irregularities in the teeth, and although it must have seemed efficient, its tendency was to produce deformity in the expression of the face.

If one or more of the superior bicuspid be removed, in order to allow the cuspids to come into place, the superior arch will be shortened, causing a depression of the upper lip and a protrusion of the under lip; the superior incisors soon begin to shut upon the edges of the inferior incisors, and in the course of time are very likely to shut inside. I speak from experience, having commenced to practice in 1839, when dental tuition was rarely to be had, making my own way as best I could. The first errors I ever committed in practice were the extraction of the teeth with a view to correct irregularity. The evidence of them is still before me, and I have mourned over them and wished I could recall the errors thus committed.

I practiced the old mode, which was to extract, not according to the plan advocated by some, viz., to remove teeth promiscuously with a view to correct irregularity and prevent *contact*, but according to the

intelligent and approved plan most taught, which tended toward keeping the mouth true and the teeth evenly balanced.

At best it came far short of producing the desired effect, but tended markedly toward the depression of the face and loss of individual expression.

Let me urge you most earnestly to avoid extraction; preserve the teeth and expand the jaw by the use of wedges of compressed wood, thus bringing the teeth into position and preserving the individual type.

Dr. Benjamin Lord. On behalf of the society and for myself, I wish to thank Dr. Dodge for his very excellent paper. It certainly shows much consideration of the subject, and is most admirably expressed.

The views are very suggestive and well calculated to lead to moderation in practice. The doctor does not give us the most progressive ideas and practice, but rather the views of older men and past years. Perhaps we have progressed too rapidly, and will need to take the back track. I think there can be no question but that this is true of some of our theories and practices. While I admire the paper and feel that there is great good in it, and that it will without doubt do good, I cannot but believe that great care should be observed in advocating the practice of extracting the teeth. It is our business to save the teeth, to prevent the necessity of extracting, and I am glad that I have lived to see the day when the teeth are kept in and preserved, and not taken out. I shall never cease to regret that I extracted so many teeth during the early years of my practice. There can be no question but that the more simple cases of irregularity can be corrected by the extraction of one or two teeth, and it is just as true that not only has the irregularity not been corrected, but deformity added by the extracting. I will say that it is neither my experience nor observation that it is better to extract the first bicuspid rather than the second, as I think Dr. Dodge recommends. I think for many reasons it is better to take the second instead of the first when we propose one of them. I would not extract the sixth-year molars if it is possible to preserve them in a healthy condition, as I believe there are other and better means of securing the desired end. I consider that the great loss of masticating surface by the tipping forward and back of the adjoining teeth is a very serious objection to the removal of these teeth; and to prevent this, if I could not preserve the whole of the crowns, I would preserve a part of them, and if a part could not be retained, I would cut away the whole of the crown and let the roots remain, if in a healthy condition. If I was obliged to extract one or more of these teeth from either jaw, I would not, except in cases of irregularity, extract the antagonizing teeth, as was formerly, and is yet, the practice to a greater or less extent. I think it is oftener wise to extract the wisdom-teeth if they show signs of early decay.

This whole subject is one of a thousand aspects, and can only be even reasonably well comprehended by careful and thoughtful attention.

Dr. J. R. Goble. I have been very much interested indeed in listening to the very able paper read by Dr. Dodge, and have been led to think over cases that have occurred in my own practice. I do not approve of the indiscriminate extraction of teeth; on the contrary, I may say that it is my last resort. In cases of irregularity I am governed by circumstances; sometimes extract, oftener do not. That irregular development is hereditary I am convinced. I have a lady patient who has but two superior (central) incisors, the laterals never having appeared. She is the only one of a family of five children having this irregularity, her mother and grandmother having the same deformity. I must say I do not agree with Dr. Dwinelle that extracting the six-year old molars or bicuspid in an over-crowded arch has the effect of producing in after-years a deformed articulation, such as he has presented here to-night. I never yet in my practice met with a case of irregular articulation that could be justly charged to that cause. I had a lady patient in my office to-day who had had extracted by Dr. Dodge's father the first right superior bicuspid, in order to regulate her teeth. At that age (fifteen) her articulation was perfect. Two or three years later in life she had the misfortune to lose a six-year-old molar on the opposite side, which left a space on that side, which still exists, while the space of the bicuspid was filled up by the canine and the articulation was normal. I believe in saving teeth where it is practicable. We may differ in our views in regard to the practicability. I fully agree with Dr. Atkinson that we should always exercise and be governed by *good, honest, common sense* in all our operations.

Adjourned.

FIRST JUDICIAL DISTRICT DENTAL SOCIETY.

REPORTED BY F. M. ODELL, D.D.S.

At a regular meeting held February 1st, 1876, President J. S. Latimer in the chair, Subject—Methods and Materials for Filling Teeth, the subject was opened by

Dr. A. C. Hawes, who likes tin-foil for filling children's teeth, prior to their ninth or tenth year, better than any other material; there seeming to be a greater affinity of the acids of the mouth for the tin than for the teeth.

Dr. Chittenden, of Canada, said, Tin is one of the greatest preservers of the teeth; thinks the galvanic action determines to the tin and consumes it, thus preserving the teeth by diverting the current to the metal; recommends tin-foil particularly for frail teeth.

Dr. Wm. H. Allen has never used much tin-foil; "for children's teeth of a good character generally use amalgam; think anybody can use it with more certainty of doing good work in such cases, and it can be done so quickly as to protect the cavity from moisture until after the filling is safe. For teeth of a poor character I use gold, as it does better."

Dr. C. E. Latimer indorses Dr. Allen's remarks; "think amalgam the best possible filling in such cases; treat the teeth just as gently as possible, and wash the amalgam with a solution of chloride of soda. Amalgam can be inserted with less pain than anything else. Oxychloride of zinc, if used in such cases, drives your patients to you next time in great pain, or drives them away. Just as soon as you excite in your patient pride of the teeth, you accomplish good for them. Bevins's filling (gutta-percha), with plenty of silex in it, if quite near the pulp, answers a good purpose."

Dr. Tod prefers Hill's stopping in the temporary teeth.

Dr. Atkinson thinks it is the operator, not the material, which preserves the teeth; "it does not come within the range of human sharpness of insight to determine whether a filling is in actual contact with the walls of a cavity or not. Any cavity perfectly impervious to air and moisture may be filled with any substance not soluble in the fluids of the mouth. When you speak of the best materials and the best methods for filling teeth, you must make a specific statement of what your case is. With oxychloride, if you bring your paste against the ends of the fibrils of the dentine, you will give your little patient a great deal of trouble. If the margin of your cavity is impervious, your tooth is safe; that is the point which really has been the destructive one where amalgams are used. In relation to the galvanic action, gold and tooth-substance are so nearly always in balance, that I do not think there is ever a case where the tooth can be electro-positive to gold. Suspect that the discoloration in gold may be the 'purple of Cassius.'"

Dr. Thos. H. Burras said, "History repeats itself, humanity repeats itself, and I find that the material practice of dentistry repeats itself! In 1834, when I used as a filling 'The Royal Mineral Succedaneum,' I got blackguarded by some of the older dentists for doing so; and in the earlier days, when I used tin-foil, I got blackguarded for that; then we used creasote and arsenic, and were blackguarded for that. We used to dry exposed nerves and cap with lead. By the addition of tin to the 'Royal Mineral Succedaneum,' it has been used ever since to great advantage, under the name of amalgam. The whole thing depends upon the operator. I fill children's teeth with tin; have not succeeded so well with amalgam. I shall next hear that creasote and arsenic, for destroying the nerve, has repeated itself."

Dr. Stockton has ceased to wash his amalgam; he said that "Dr.

Lawrence, of Lowell, does not wash his amalgam fillings, and they are very perfect; thoroughness of work saves the tooth."

Dr. Miller. "I seldom use oxychloride, as, unless kept dry for a great length of time, it will waste away. Hill's stopping is good if it does not come to too much wear."

Dr. Odell laid great stress upon "cutting out the fissures thoroughly. Believe in gold and amalgam for outsides of fillings; can pack gold better and easier than tin-foil, and prefer it vastly. Before Dr. Bogue's 'ukase' went forth, washed my amalgam; since that time have not done so, but have yet to find a difference in work antedating or post-dating that event"

Dr. Jarvis has usually found tin-foil to disappoint him; likewise Hill's stopping. Sometimes they would become rotten, as it were, and waste away, at times wear cup-shaped, etc., necessitating another operation; "although in 1848 I saw a filling of tin which had been in thirty-two years. Find amalgam to oxidize; can scarce conceive of a case (leaving out of the question the item of expense,) where I would not use gold. If the cavity is not accessible, we must make it so. Believe in washing amalgam, and do not think the fillings need to be black."

Dr. Littig has "seen some of Dr. Lawrence's fillings which, although very dark, were evidently preserving the teeth. Find gutta-percha to act as Dr. Jarvis says, become rotten," etc.

Dr. Bogue has had it in mind, for a year past, to write an article, "How to put in an Amalgam Filling;" the reason of his not doing so being that he don't *know how*. Does not approve of washing amalgam fillings for two or three reasons.

1st. The moisture prevents the perfect consolidation.

2d. It will take two or three times as much mercury.

3d. Moisture certainly imparts to it a tendency to "ball," giving more opportunity for oxidation, and for fillings to grow black.

"I think the black may be prevented by putting a little tin over the surface. Mixed up about the consistency of damp sand, in shape like little cheeses, and packed with an electric mallet, amalgam will be hard in about twenty minutes (which result it is impossible to obtain if washed), and with less mercury than is ever used; the moisture causes the centripetal force to act, resulting in balling up, and consequent drawing away of the filling from the walls of the cavity."

The doctor here exhibited a tooth with one corner built down, using alternate layers of No. 40 platinum and No. 60 gold, which he thinks makes a more presentable restoration of contour than to use gold alone, the shade to be varied by a preponderance of either metal, as desired; being careful to not heat the platinum so high as to burn the gold from its surface.

Dr. Francis. "Suppose the best material for filling the teeth is a substance which will most perfectly seal up a cavity and preserve it for a great length of time. Many things to consider before proceeding to fill a cavity—such as size, shape, position, etc. In the majority of cases believe gold to be the best; but in a great many cases gold will not preserve a cavity from decay; certainly a great deal does depend upon how the operation has been performed. Have known amalgam to stand for twenty years, but the teeth were very hard. More depends upon the texture of the teeth than on the manner of putting in the filling."

Dr. Odell has "absorbed superfluous mercury from the surfaces of amalgam plugs for years, by working upon the surface tin- or gold-foils, the result being plugs which do not discolor."

Dr. Lord mentioned a case of sixty years' standing for a tin filling, and another of twenty-two years of amalgam; and that he had seen such fillings by Dr. Clowes twenty years ago. He also cited a case of ten years' standing, filled with Bevins's stopping. Considers this the best form of gutta-percha filling. Says the best Bevins's stopping is made by Codwell, of Boston, who issues a hard, and a tough variety, of which he considers the tough the best.

AMERICAN DENTAL CONVENTION.

THE twenty-second annual meeting of the American Dental Convention will be held in Philadelphia, commencing Tuesday, August 8th, at 10 A.M. The opening session will be held in Trinity Methodist Episcopal Church, Eighth Street, above Race; the remaining sessions at the Pennsylvania College of Dental Surgery, Tenth Street, below Arch.

There is no permanent membership in this organization and no initiation fees; dues being expected only from those attending the meetings. The profession is cordially invited to be present and participate in the proceedings.

The name of Dr. W. F. Marshall, of New York, was accidentally omitted from the list of clinical operators published last month.

AMBLER TEES, *Secretary*.

AMERICAN ACADEMY OF DENTAL SCIENCE.

THE ninth annual meeting of the American Academy of Dental Science will be held in Boston, on Monday, September 25th, 1876, at 10 o'clock A.M.

The annual address will be delivered at 2 P.M., by Dr. Robert Arthur, of Baltimore

E. N. HARRIS, *Corresponding Secretary*.

SOUTH CAROLINA STATE DENTAL ASSOCIATION.

At the annual meeting of the South Carolina State Dental Association, the following were elected officers for the ensuing year:

President.—Dr. G. W. Norwood.

First Vice-President.—Dr. J. R. Thompson.

Second Vice-President.—Dr. D. L. Boyer.

Corresponding Secretary.—Dr. H. D. Wilson.

Recording Secretary.—Dr. G. F. S. Wright.

Treasurer.—Dr. T. W. Boucher.

Adjourned to meet in Columbia, the first Tuesday in June, 1877.

G. F. S. WRIGHT, *Recording Secretary.*

CORRECTION.

IN a synopsis of an essay that I read before the American Dental Convention last August, at Long Branch, on crystal gold, published in the November number of the DENTAL COSMOS for 1875, the impression is conveyed to the mind of the reader that mercury is used in its preparation. I stated distinctly that the article thus made was called *sponge gold*, the result of Dr. Watts's first experimentation; but that the crystal gold now in the market was the product of *electrolysis*—decomposition by electricity. On invitation of the convention Dr. Watts explained fully his mode of manufacturing it, and stated distinctly that *no mercury* was used. Your reporter failed to give the remarks of Dr. Watts in his report of the proceedings.

Respectfully yours,

AMBLER TEES, D.D.S.

EDITORIAL.

THE ANNUAL CONVOCATIONS.

WE again call attention to the meeting of the American Dental Association, to be held in this city Tuesday, August 1st. The sessions are to be held in the Chapel of the Methodist Church on Broad Street, below Arch, and to continue during four days.

Also to the meeting of the American Dental Convention, to be held in this city, commencing Tuesday, August 8th. Its opening session is to be held in the lecture-room of Trinity Methodist Church, Eighth, above Race Street, and the remaining sessions at the Pennsylvania Dental College, Tenth Street, below Arch.

ETHICS OF JOURNALISM.

THE *Missouri Dental Journal* received our gentle reminder of its failure to credit the DENTAL COSMOS for matter copied from its pages with such good grace,—making the *amende honorable* without any quibbling,—that we are encouraged to request a like acknowledgment for the appropriation in its July issue of the concluding pages of the paper “Man and his Teeth,” by Dr. E. W. Foster, which first appeared in the DENTAL COSMOS for June.

Also for a like forgetfulness in the republication in the same number, and without credit except to the author, of a very interesting article, entitled “Pressure and Contact as Causes of Dental Decay,” by Henry S. Chase, M.D., which first appeared as part of the proceedings of the New York Odontological Society in the DENTAL COSMOS for June.

PERSONAL.

ADOLF PETERMANN, D.D.S., located at Frankfort-on-the-Main, Germany, has been appointed dentist to the court (Hofzahnarzt) by his Royal Highness Prince Karl Anton von Hohenzollern. Dr. Petermann is a graduate of the Philadelphia Dental College.

PERISCOPE.

MANIFESTATIONS OF SYPHILIS IN THE TEETH.—Mr. Napier read a short address in which, after a few prefatory remarks intimating the decision of the committee that the introduction of a subject for debate should, upon this occasion, follow the chairman's address, and expressing his hope that the subject which it had occurred to him to select would have points of interest for all who made pathology their study, he invited those present to assist in a discussion that should have for its object the consideration of the Causes and Conditions of the Disease of the Teeth commonly known as Syphilitic. He brought the subject before them specially with a view to arriving at a determination whether the existence of inherited syphilis may be diagnosed with certainty from the presence of those symptoms which are usually supposed to indicate it, or whether other causes, such as struma, the administration of mercurial medicines in infancy or childhood, severe illness during first or second dentition, or deficiency in nutrition, such as (more obviously) induces rickets, etc., may not be instrumental in bringing about results at present attributed to syphilis only. After complimenting Mr. Jonathan Hutchinson upon the results of the careful study that he has bestowed upon the subject, his labors in connection with which, it was pronounced, entitled him to the gratitude of all who were anxious for the further elucidation of the matter of which

they were at present treating, the speaker briefly enumerated his own reasons for hesitating to admit the manifestation of a semilunar notch upon the two front teeth as an infallible indication of syphilitic taint. That to which he was inclined to give most prominence was the rarity of its appearance in comparison with the number of the certified inheritors of syphilitic disease; but he also attached importance to the fact that it is wholly confined to the teeth of second dentition, although other recognized results of descended syphilis are apt to assert themselves from the commencement of, or very early in, infantile life. In conclusion, he deprecated the acceptance of any theory that has not first been submitted to the most minute tests, one of the most valuable being that which is imposed by a free circulation throughout the scientific world.

Dr. Drysdale remarked that he was surprised that Mr. Napier, with his great opportunities of investigating the subject, could express a doubt as to the character of syphilitic teeth.

Mr. F. Mason took syphilis to be a disease that infected the system, and not a local disease. He agreed with Mr. Napier that it was exceedingly difficult to make out the condition of the teeth. He could not accept Dr. Drysdale's conclusion as to the value of the so-called syphilitic teeth as a test of syphilis, inasmuch as during a fifteen years' experience he could not recall a single patient who had an infecting sore who suffered from spots or ulcerated throat afterwards, nor in cases where those teeth appeared had he ever been able to get a distinct history of syphilis.

Mr. A. Coleman said it had been his good fortune to be a colleague of Mr. Hutchinson when he first noticed the peculiarities of these teeth, and his experience was that they were almost invariably connected with syphilis. Though he fancied he had seen one or two exceptions—viz., in families where the older children presented no symptoms of the disease at all, whilst the third or fourth children showed the typical teeth, and those subsequently born presented no signs of specific disease,—yet, as a rule, he felt convinced that Mr. Hutchinson's views were correct, and even if it cannot be said for a certainty that a person with these teeth has inherited syphilis, there is at least great probability that he has.

Mr. S. Hamilton Cartwright thought that mercurial and strumous teeth had frequently been mistaken for syphilitic teeth, and that the truly characteristic type seen in the permanent incisors was one of the surest tests of syphilis. He said that Mr. Napier laid stress on the fact that the temporary teeth were unaffected; but this was naturally to be expected, since those teeth commenced calcification *in utero* at a time when specific inflammation did not take place. The permanent teeth were, however, calcified much later, and the teeth most affected—viz., the incisors—began to be calcified at eight or nine months after birth. He looked upon syphilis as an exanthematous disease running a specific course, the skin and mucous membranes being particularly liable to be affected. Now the teeth, like the hair, were merely dermal appendages, the one being formed by an involution of the Malpighian layer of the oral and mucous membrane into the submucous tissue; the other from a similar downgrowth of the Malpighian layer into the corium. The superficial structures being most affected in secondary syphilis, might it not be that the specific poison

which lay latent in them during intra-uterine life develops itself in organs formed from these superficial structures at a later period of life? Another point which led him to adopt Mr. Hutchinson's view was that the peculiar lunated notch in the typical teeth was always symmetrical, which is not the case with those irregularly formed teeth resulting from rickets, mercury, or simple stomatitis. That the bicuspid teeth were so often unaffected he did not wonder at, as they were calcified at a period when stomatitic eruptions were not so frequent, and when the poison might have been eradicated from the child's system. Mr. Napier had spoken of mercurial teeth; these he did not believe in as being different from other stomatitic teeth, for he had seen as many examples of them in Germany, where mercury was rarely given in comparison with England, where it was so frequently administered. Mercury affected the mucous membrane, and it was only in this way that it would affect the teeth, as would ordinary stomatitis. The symmetry shown in the so-called syphilitic teeth was a proof to him that syphilis in the child was of the secondary stage, and not only, as some supposed, a result of mere heredity.

Mr. Risdon, being connected with a children's hospital, doubted whether the teeth spoken of as syphilitic were really so, and he could corroborate what Mr. Coleman had said as to only one or two members of a family being affected. He thought they might be the result of struma, and when they appeared after scarlet fever they might arise from mercury.

Mr. Jonathan Hutchinson remarked that the subject had been treated so exhaustively by different speakers that he would only state his more recent experience. He wished that Mr. Napier had brought forward more facts to prove his reasons for skepticism in regard to syphilitic teeth, and he thought a good means of arriving at truth would be to challenge, in a friendly way, those surgeons who were practicing dental surgery to produce patients or casts in disproof of his experience. He did not deny that disbelief in his theory was very prevalent in all ranks of the profession, save in that which is concerned with diseases of the eye, and he did not wonder at—nay, rather admired—the skepticism of those who thought that the malformation of a single pair of teeth could not be indicative of specific disease. Had it not been for his experience of diseases of the eye, he might have joined their ranks. He was surprised to find at the Pathological Society some time since how many did not understand the peculiar types of syphilitic teeth, and it was therefore necessary to have the most intimate knowledge of their special characteristics, for he was decidedly of opinion that they were quite distinct from all ordinary forms of malformation. If he saw a pair of central incisors with the peculiar lunar notch, he would feel certain that the possessor of them had been syphilitic. Other teeth, no doubt, were often malformed, but not in that peculiar way, and he should therefore draw attention to those teeth only,—viz., the permanent central incisors of the upper jaw. He thought that the reason why other teeth were so affected was probably owing to the fact that those suffering from syphilis had taken mercury, which also left its mark upon the teeth, and he inferred that those who had taken least mercury would present the most perfect syphilitic teeth. (Mr. Hutchinson here explained his theories by means of various diagrams.) He then alluded to an interesting case which had recently come under his observation. Mr. Waren Tay was

seeing his patients at the Skin Hospital, when a woman with acne on her face sought his advice. On examining her he found the peculiar syphilitic teeth, but no other indication of that disease. She was sent to me for examination. There were no syphilitic symptoms, for she stated that her sight was perfect, but on examining her I found that she was suffering from defective vision and had marked choroiditis; and this latter, in conjunction with the malformed teeth, is an almost certain proof of inherited syphilis. Concerning mercurial teeth, he fully admitted the justice of Mr. S. Hamilton Cartwright's remarks as to the probability that they were in reality stomatitic, or at least owing to the somewhat similar effect of that mineral upon the mucous membrane, which in English practice, he believed, was by far the most frequent influence which produced them, and his attention had been drawn in that direction because they were nearly always found in connection with lamellar cataract. Mr. Coleman and himself hit upon the fact that lamellar cataract is always found in connection with ill-formed teeth, and were generally connected with convulsions in infancy. He thought that the convulsions caused lamellar cataract, and the mercury given to cure them the malformation of the teeth; and just as the central upper incisors were the test teeth for syphilis, so the first molars were the test teeth for mercury, the other teeth not being so affected, owing to the fact that they were developed at a period when stomatitis was not so frequent. Mr. Hutchinson finally suggested that fellows of the association should attempt to discover whether any peculiar signs were to be found in the teeth of those of a rickety or scrofulous diathesis, for information on these points was of the most vague description, and that in ophthalmic practice was to be found the best confirmation of syphilitic teeth.—*Discussion in the Association of Dental Surgeons Practicing Dentistry, in The Lancet.*

WHEN IS THE USE OF THE GUM-LANCET REALLY INDICATED?—Lately I have had varied forms of constitutional disturbance among children, ranging from seven to nine months old, but especially ailments connected with the nervous and respiratory systems; and in nearly every case have the mothers and nurses regarded these maladies as peculiar to dentition, and that alone, and insisted on the barbarous empiricism of having the gums lanced, though they had nothing to warrant them in this but that the child was near the end of the eighth month, when the first teeth should make their appearance.

When I was a student, lectures were given on the general management of teething children, to which I have adhered, and have seldom been disappointed; but the other day, on refusing to accede to the popular demand of lancing the gums, much to my surprise, I was shown an edition of a late work recommending this, nay, more, by an eminent member of the profession, "On the Management of Children," which undoubtedly tended to justify their ill opinion of me, the rules laid down there being very different from those I had been taught.

No doubt, some of your correspondents have similar cases to deal with almost daily, both in respect to the nurses and children, and, perhaps, they would kindly let me know if they follow out in practice the coarse mechanical theory of the nurses, that all diseases that may come on during dentition must of necessity be connected with that

process, and, at their request, lance the gums, and thus retain their patients; or, if they scout this and all other meddlesome surgery, at the risk of losing a good patient, as I have unfortunately done in this instance.—*Robert Torrance, in British Medical Journal.*

WHEN IS THE USE OF THE GUM-LANCET REALLY INDICATED?—It is not, I think, difficult to furnish a satisfactory answer to the query of Mr. Robert Torrance in the *Journal* of May 13th. When the time has arrived at which the eruption of the teeth should commence, each tooth lies in an almost completely closed bony crypt within the jaw. The eruption of the teeth is a process of gradual elongation of the teeth on the one hand, and of simultaneous absorption of the superimposed tissues on the other. The absorption commences first in the overhanging margins and front walls of the crypts, which gradually disappear until room is afforded for the advancing tooth. The growth of the tooth keeps pace with this absorption; and, the crown at length pressing against the remaining membranous coverings, these undergo atrophy, and, becoming by degrees thinner, and at length transparent, give way, and disclose the advancing tooth. Disorders of dentition are believed to arise when these various actions are not perfectly harmonious in their course, the advance of the tooth being more rapid than the disappearance of the inclosing bony and soft tissues. The tooth is thus mechanically held in position, and irritation is set up, manifesting itself by reflex nervous disorders or constitutional disturbance.

It is obvious that the utility of the operation of lancing the gums must be extremely doubtful when it is carried out prior to the passage of the tooth through the contracted orifice of the developing alveolus; but it may be reasonably expected to afford relief in cases where the tooth can be distinguished beneath the indurated, tense, and swollen gum. The evidence that immediate relief to severe symptoms does follow the judicious performance of the operation is perhaps incontrovertible; and as the procedure inflicts little pain and no injury, and is practically free from danger, it should certainly be resorted to where even a chance of benefit resulting appears.—*Henry Sewill, in British Medical Journal.*

In a recent lecture on the First Dentition, I considered the subject of lancing the gums in the disorders attendant upon that period; and alluded to the empiricism and irrationalism often exhibited by even intelligent practitioners in relation to that practice. It may be briefly said that the lancet should never be used without full knowledge of the times and phenomena of evolution; and that lancing is of no avail—1. During those periods of repose which occur alternately with the active eruption of the teeth. 2. When the bone superimposed over the advancing teeth remains unabsorbed. It is of avail—1. When evolution is proceeding with great activity, the gums remaining hard and tense, thus offering an obstacle to the eruption of the tooth; 2. When the gums are much inflamed and congested; 3. In cases where precedent has proved it useful, in cases of diarrhœa, convulsions, etc., which are plainly owing to sympathetic irritation. The great desideratum is not the use of the lancet without first diagnosing the true source of diseased action; whether it be connected with eccentric irritation from the teeth or other organs, or is the result of centric and organic lesion; whilst it should be borne in mind that the most serious cer-

ebral symptoms may equally be caused by congestion and anæmia of the brain, so that it is of the greatest importance to appreciate the indications of such opposite conditions accurately, if it be wished to treat them rightly.

Every surgeon who uses the gum-lancet on rational and defined principles, like the recent correspondent in the *Journal*, to whose queries I have attempted to reply, deserves the gratitude of his profession, inasmuch as he thereby assists to dispel that dense cloud of ignorance which is engendered of unqualified midwives and confidential nurses, to the great detriment of the child.—*S. Hamilton Cartwright, Professor of Dental Surgery, King's College, in British Medical Journal.*

THE letter of Mr. Robert Torrance, which appeared in the *Journal* of May 13th, seems to affirm the belief that lancing the gums of infants is, under any circumstances, unnecessary and unjustifiable. I infer this from his styling the practice "barbarous empiricism." He leads us also to assume that such was the teaching of his student days. It is much to be regretted that diversity of opinion should exist upon a simple subject that should admit, physiologically and pathologically, of easy solution. *Pour moi*, I always carry the gum-lancet, and believe it to be indispensable in the treatment of the ailments of children; yet I have met with practitioners, otherwise intelligent, who entirely discountenanced its use. It cannot surely be doubted that dentition is a most prolific source of the diseases of childhood, arising, doubtless, from the growth of the teeth in a degree disproportionate to the expansion and absorption of the tissues overlaying them, producing pain, inflammation, and restlessness, with the long train of symptoms due to sympathetic effects on the nervous system. This condition of the gum is not a mere matter of speculation, but it is quite apparent to the eye. In such a state, I nearly always find the free use of the lancet affords almost immediate relief. This is just what we might expect, in accordance with the first principles of our profession, which teach the cure of disease by the removal of its cause. Why a different rule of practice should prevail in the case under consideration I am unable to see. Palliative treatment, by medication or otherwise, seems only appropriate when disease is irremediable, and not, as in the case before us, when it admits of easy and effectual cure. In infancy, the administration of medicine should, as far as possible, be avoided; more especially of sedatives or hypnotics, on which the objectors to the gum-lancet must mainly rely for the allaying of that irritability which is so frequent a symptom of dentition.

Analogy, too, helps us to a true line of treatment. Given a case (not very uncommon; the writer has himself been the subject) of a patient suffering from inflamed gum consequent on the cutting of a wisdom-tooth, what is the treatment Mr. Torrance would adopt for its speedy relief? Surely not medication; and, if not, why should other treatment be indicated in the similar case of an infant? Indeed, this *laissez faire* style might, with equal show of reason, be applied to the treatment of gum-boil, or any other abscess.—*Robert Huntley, in British Medical Journal.*

TRANS- AND REPLANTATION OF TEETH.—At the conclusion of a lengthy article in the *Wiener Medizinische Presse*, No. 11, 1870, Dr. L. Rabatz, court-dentist at Vienna, lays down the following rules,

which he has adopted for his own guidance in transferring and replanting teeth :

1. Only one, or rarely two, teeth can be replanted at one time; in all cases the roots must be as straight as possible.

2. Replantation has a good chance for success only in young and healthy individuals.

3. Teeth standing alone, or which are loose or atrophied, or the alveolus around which is disappearing, as well as teeth with exostoses, are not fit for replantation.

4. In extracting the teeth the gums must not be lacerated, nor the alveolar ridge broken.

5. If the pulp and the peridental membrane are sound, replant the tooth at once as it is.

6. If the pulp be diseased, cover it, fill the tooth, and then replant it. (It is obvious why the tooth should be excavated and filled before replanting, as the pressure made during these operations would irritate the periosteum and retard or prevent the separative process.)

7. If the periosteum be unhealthy, it should be scraped off, the fang slightly shortened, and the tooth replanted.

8. Put every tooth for a moment in warm water before replanting, so that it may be warm enough on being placed in the alveolus not to chill the periosteum; also syringe the alveolar cavity with tepid water so as to remove any blood-clots. The Americans advise washing the fang with carbolized water and a weak solution of chloride of zinc; and when the success of Lister's plan of treating wounds is borne in mind, nothing can be said against this method.

9. After the tooth has been placed in the alveolus in its normal position, it must be kept there without any disturbance for at least three or four weeks by a bandage or ligature, which must be adapted to each case. No food must be chewed on that side of the mouth for two or three weeks.

10. During the resulting inflammatory processes, cold applications in the mouth and upon the cheek will be found to be of great service.

Dr. Rabatz concludes by remarking the small number of teeth that may be replanted in comparison with those that should not be, and calls attention to the facts that the operation must be narrowed down to a small class of individuals, that a slight mishap in extracting the tooth may effectually interfere with the success of the operation, that one side of the mouth cannot be used for two or three weeks, and that the annoyance and irritation of a bandage or ligature in the mouth must be submitted to.

He adds that for these reasons, and as we can never give our patients a decidedly favorable prognosis, replantation should not be considered as a universally received and unobjectionable method for the preservation of teeth, but may be employed with a fair prospect of success in a small number of exceptional cases.—*Translated for the DENTAL COSMOS.*

ARTIFICIAL TEETH REMOVED FROM THE TRACHEA.—Mr. Gould exhibited for Mr. Heath two sets of artificial teeth, each consisting of a gold plate and two teeth, which had been dislodged from the mouth of a young lady during a fit, the one passing into the œsophagus, and the other into the larynx. The patient complained of pain and some dys-

pnœa. An œsophageal probe was passed into the stomach, to the relief of these symptoms, but the voice remained laryngeal in character. On the third day there was increased dyspnœa with laryngeal breathing, and on laryngoscopic examination the teeth were seen lying below the vocal cords. Mr. Heath removed them by tracheotomy. Soon after, the other set was passed by stool.

The president said that he had pointed out the danger of sleeping with artificial teeth.

Mr. Gould replied that the accident occurred during a fit at night; but the teeth had not been firmly fixed.—*Reports Pathological Society, in Med. Times and Gazette.*

HINTS AND QUERIES.

HAS any one been using the celluloid base with plain teeth for permanent cases, making artificial gums of the celluloid? Will the gums thus made hold their color? And do the plain teeth adhere to the plate sufficiently well for permanent work? Some one who has had experience please answer, as I am troubled a great deal by block teeth cracking.—B. A. M., *Rockport, Ind.*

WILL cement plombe and similar preparations expand?

On May 11th, filled pulp-chamber of right superior first bicuspid with cement plombe; the opening was made between the cusps. On the posterior was a gold plug, inserted five or six years ago, and in good condition; otherwise tooth seemed strong. On June 5th, patient felt a sharp pain in tooth while eating dinner. On examination found the palatal cusp broken off above the neck of the tooth. The occlusion of the jaws is such, and the denial of the patient so positive, that I doubt its being caused by biting on a hard substance. If not expansion of the cement plombe, what was the probable cause?—C.

ABOUT two months since I filled all the upper front teeth of a large, healthy man, aged about 28 years. The cavities were all shallow, the dentine not sensitive. I examined his mouth about two weeks ago, and found the fillings all right. He came into my office this morning complaining. On examination, the right lateral was found loose, and very slight inflammation around the border of the gum; no evidence of pus. I should like information as to the pathology, and suggestions as to treatment.—G. W. S.

REPLY to "P. A.," who asks what the dentists in Philadelphia do with aching milk-teeth too far gone to attempt to save.

An excellent plan is to supply the mother of a child so afflicted with an ordinary mouth-syringe, with which—using warm water in which has been dissolved a small quantity of carbonate of soda—the aching member is to be washed thoroughly, thus ridding it of any foreign particles that may have lodged in the cavity, and, at the same time, making bland the fluids of the mouth. Should this fail, oil of cloves or creasote may be tried. Any mother will soon learn to use either of the agents with delicacy; the proper mode of use being to take a tuft of cotton, about the size of the cavity in which it is to be used, and after partially saturating this with water, to touch it to the agent. In this way, the little that is needed to act upon the pulp is most conveniently secured, while risk of burning the mouth is avoided.

An article highly lauded in this direction is the sulphate of atropia; one grain

to the ounce of water being the strength of a solution that may be ordered and intrusted to the mother. To use it a tuft of cotton is to be saturated and placed in the cavity of an aching tooth. It is well to have the bottle containing the medicine marked "Poison," that no mistake may occur.

Where aching teeth exist in the mouths of children of typh condition and tendency, great advantage arises out of the use of acids, both locally and internally, preference being given to the officinal dilute hydrochloric; from five to ten drops in a wineglass of water being a fair quantity to employ; this being repeated three times a day, for internal use, and the mouth washed with it several times daily.

Where decided inflammation exists in an exposed pulp, there is, perhaps, no better application than that found in combining lead and opium with water. A very good formula of proportions is as follows:

R.—Plumbi acetatis, gr. iij;
Tincturæ opii, gtt. xx;
Aquæ, fʒiss. M.

G. D.

REPLY TO "C. F. Y.," in June DENTAL COSMOS.—The "sores" alluded to belong to the class known as epithelioma, and consist essentially of epidermic tissue in a pathological state. The forms assumed by the disease are various. When of the nature of an open ulcer, the name of "ulcus rodens" is frequently applied to it. This is the character most frequently met with upon the lip.

Whether or not epithelioma is the true cancerous disease is a matter that has elicited much discussion. Certain it is, however, that the common tendency is towards the destruction both of a part in which it is situated, and the life of the individual affected.

In deciding on the nature of an epitheliomata, we know of no better rule than that laid down in Garretson's "System of Oral Surgery," namely, to consider and treat as true cancer that which you cannot prove to be otherwise. In following such a rule, the practitioner saves himself from an improper meddling, and has the satisfaction of knowing that he has not aggravated—a very important matter, as very little experience in the direction serves to demonstrate.

As arguments favoring the relationship between epithelioma and cancer, the following are to be considered:

1. Its infiltrating character.
2. Its tendency to infect the lymphatic glands.
3. Its tendency to recur after removal.
4. Its fatality.

As arguments on the other side:

1. The excessively rare occurrence of consecutive deposits.
2. Its anatomical structure.
3. Absence of primary cachexia.
4. Its frequent local origin.

The writer has no doubt in his own mind concerning the oneness of cancer and many of the epitheliomata; but it is to be considered that a great variety of pathological conditions are met with upon and about the skin which are not of cancerous nature, as, for example, warts and corns and syphilitic indurations are diseases of the skin, but assuredly are not cancer. The epitheliomata are inclined to show a cancerous nature when such cachexia is in the blood. Cancer is to be considered a constitutional disease; local disease is only an expression of the general vice.

Concerning the "sores" met with upon the lower lip, it is to be advised that a

treatment be directed with the closest circumspection. No injudicious meddling; no worrying with cauterants. Outside of the most soothing applications, it is always better to do nothing until a diagnosis is fully established. The most distinctive sign of cancer in this situation is the giant character of the granulations showing sooner or later upon the surface of the ulcer. These seen, the sooner an operation is performed the better. Delay is fatal.

It is to be noted, however, that to the experienced eye there are observable peculiarities about a cancer sore, which permit of inferences being drawn as to its character long before giant granulations present themselves. It is greatly to the advantage of a patient, when his good fortune brings his case first under such an eye. C. F. Y. will find himself master of the secret should he spend a few months in any hospital where cases of this character abound.—A. B. C.

REPLY TO "JUNIOR," who asks for the means to be used in distinguishing the existence of fungi in carious teeth.

While the means lie in the use of a microscope, yet the employment of such instrument is unnecessary for the common details of practice, inasmuch as no single cavity can be found in which fungi, animal or vegetable, do not exist.

One of the common causes of failure in dental operations is to be looked for in such direction, as it is to be maintained that no filling, however good, will preserve a tooth in which, before its introduction, the parasitic inhabitants of the cavity have not been destroyed.

From a strictly clinical stand-point, the names and appearance of the dental fungi are entirely unimportant. It is all-important, however, that these foreign bodies be completely destroyed, and for such purpose every cavity, after being prepared for its filling, should be thoroughly saturated with creasote. The writer would suggest, that in such application lies one of the secrets of successful practice; that it applies so particularly in the case of soft tooth; that without the use of this, or a similar agent, a cavity is about as well unfilled as filled.—A. B. C.

REPLY TO "C. S.," who asks as to the probable relation between a pain in the temporal region and a bicuspid tooth.

The case cited is certainly not a common one. Yet the cause of the pain, as attributed by the patient, is not unlikely to be the right one. C. S., in recalling the anatomy of the part, will find that the dura mater of the locality is supplied by a nerve-filament running from the ganglion of Gasser; this appreciated, little difficulty will be found in associating the affected part with the tooth mentioned.

In endeavoring to diagnosticate a relation, C. S. will find it advantageous to analyze thoroughly the condition of the presumed tooth. Pain of distant parts arising from pathological conditions of the teeth is most apt to have its origin in dental exostosis. If, in examination, the root of this particular tooth is found affected after such manner, we would advise an immediate extraction of the organ.

Another common cause of such reflected pain is to be searched for in calcification of the dental pulp, or in the deposit of dentinal nodules. Some of the most unyielding and persistent of neuralgic pains arise from one or the other of these conditions. And, unfortunately, these show little or no sign of the relationship.

If, in examining into the nature of the case, C. S. can find no other cause for the pain complained of, let the plug be taken from the presumed tooth; it may be that there is a dead pulp, or, as the result of the presence of the metal, a sufficient excitation of the pulp may have been aroused to result in the formation of nodules.

In watching the case, if any paroxysmal tenderness or pain that may show itself

in the tooth be associated with increase in the head-symptoms, the diagnosis of a sympathetic relation may be considered fairly established.—T. T.

REPLY TO "C. L. M.," who asks as to the length of time usually required for the exfoliation of a dying lower jaw, and the best course to pursue in the interim.

The ordinary time is nine months. In the interim, that attention is required which shall suffice to keep the parts clean, and, as well, every means is to be employed which shall afford proper support to the system at large. In cases of phosphor-necrosis particularly, the drain upon a patient is so great that, if he die not from pus-poisoning, he is in danger of losing his life through such drainage. Consequently, the judicious surgeon considers diet as among the first of the requirements. Cleanliness and diet we would suggest as the immediate requirements of his case.—O. N.

IN reply to "F.," on applying rubber dam, "Rex," in the June Cosmos, has given a pretty thorough explanation, leaving little room for further comment. I can only add my "mite," hoping it may be of service to some one. After the dam has been punctured, and is ready to apply, take a small piece of white castile soap, moistened, and rub over the holes, on the side going next to the teeth, thus enabling the dam to pass between the closest teeth without danger of cutting the rubber. This obviates the use of file or disk. My method of applying the dam on the oral and bicuspid teeth is: Puncture one hole large enough to go over two (2) teeth, the one to be operated on and one adjoining; place the dam in position, holding it with the left hand; with the right, drive a wedge between the teeth, letting it extend through far enough on the inside to hold the dam up. Cut the wedge close to the teeth on the outside. The wedge not only holds the dam in position, but keeps the teeth separated. I find this a much easier mode than using strings, saving time to operator and pain to patient.—H., Troy.

"TO AMALGAMITES."—Amalgam, when used in a dry state, if patiently manipulated in a clean, dry cavity, it is said, makes a good filling; but it is sometimes tedious, not to say a positive bore, to work it in this semi-pulverized condition, in almost inaccessible positions. In cases of this kind, might we not be justified in mixing more mercury with the filings, thereby rendering the mass more plastic and consequently more easy of manipulation? but then it may be objected we shall have a surplus of mercury. Well, remove this surplus with one sweep of a pellet of tin-foil. The mass will still be too plastic to suit the fastidious; and here is where my suggestion comes in. I would suggest that the manufacturers make a foil, or, rather, thin chips of suitable sizes, of the same composition of their alloy. This foil, or these chips, could be readily carried into place and amalgamated with the mass already in the cavity. We would, by this means, obtain a uniform stopping, easily introduced, free from surplus mercury, free from balling, and hardening quickly. Of course, I never use amalgam. I purchase it merely to look at. I belong to that class of dental wiseacres who stand on such a lofty pinnacle of dignity and grandeur that they scorn to descend so low as to use anything but the most costly and the most precious of metals; but being now in one of my charitable moods, I make this suggestion for the benefit of those of my deluded brethren who are compelled to use the vile stuff!—A. B. DOREMUS, D.D.S., Neuchâtel, Suisse.

REPLY TO "F. F. D.," who asks, in June COSMOS, How to mend rubber dam?

Cut a piece of the thinnest dam large enough to cover the holes or rent, then heat a spatula to cherry-red; pass it lightly over the perforations, just sufficient to soften the surface of the dam you wish to mend. Do the same to the patch; press the two softened surfaces together. Lay the dam away for a few days, wash it, and it is as good as new.—W. H. SCHOLL.

REPLY TO REQUEST OF "F. F. D.," as stated in June number DENTAL COSMOS.—Take a small, wide-mouthed bottle and put in a half-ounce of benzine, and into this put as much common dental rubber—such as is used for making plates—as it will dissolve. Use this as a cement. Mend the holes in the coffer-dam with pieces of itself cut to the proper size, using your cement to unite them. It will dry quickly by evaporation of the benzine, and is entirely impervious to moisture; in fact, it will bear considerable stretching, if necessary, without tearing apart.

Either the red or black rubbers will dissolve in the benzine. I am using red, but presume the black would look better.—J. H. SPAULDING.

REPLY TO "G. F.," who asks, in the July COSMOS, for "the best method of removing calcareous deposits from the roots of teeth, and the subsequent treatment."

Calcareous concretions should always be started from the teeth by placing the scaler adapted to each against the margin of the deposit; then have an assistant give a blow sufficient to start the scale from its attachments, in a mass or in fragments. After loosening up every particle of the deposit by successive taps with the mallet, wash out thoroughly with warm salt water, and treat with tannin and glycerin, chloride of zinc, or aromatic sulphuric acid, according to indication.—A.

DENTAL GARDENING.—Thinking the following case in practice might be of interest, I take the liberty of reporting:

Miss Adelia L., aged 28, nervous temperament, very healthy and robust, consulted me on May 10th, in reference to trouble with left superior second bicuspid. I found, upon examination, a large cavity upon posterior surface, high up under the gum, with exposed pulp and considerable inflammation, attended with severe pain. The cavity being extremely difficult of access, and the patient preferring not to take the chance of possible trouble after a painful operation, I extracted. A moment after, I proposed to her, partly in jest, to fill and replace it. She agreed, and after excavating, etc., I filled the pulp-canal with oxychloride and cotton fiber, and the outer cavity with amalgam, and then, carefully rinsing the socket first, the tooth was carried up gradually into the alveolus, carrying with it a piece of silk, which was laid longitudinally along the root, in such a manner that, when the tooth was nearly in place, the gradual drawing out of the silk furnished a *vent* for the escape of air or water confined above the root. Previous to replacing, about one-sixteenth inch of the tip of the root was excised, as it was curved considerably. Pain followed for five minutes, after which the lady closed the teeth forcibly, and with a snap, without any feeling of discomfort. She was directed to avoid using it for a day or two, and then report. Ten days after, May 20th, she came in and stated that for a couple of days there was some soreness, since which time she had eaten on that side of the mouth without trouble, and at the time of examination the tooth was as firm as the contiguous ones. No ligatures were used to keep it in place at first, as reliance was placed upon the antagonists in the lower jaw.—W. E. HYDE, *Danielsonville, Conn.*

THE
DENTAL COSMOS.

VOL. XVIII. PHILADELPHIA, SEPTEMBER, 1876.

No. 9

ORIGINAL COMMUNICATIONS.

PHASES OF PROFESSIONAL DEVELOPMENT.

BY W. C. HORNE, D.D.S., ROME.

Third Paper.

WHILE dentistry is claimed by its professors to be a "specialty in medicine," some of the organs of medical opinion scout at the pretension. "We acknowledge you as Dentists," say they, "but as Doctors, never! You are not of our fold; you have not been trained in our schools; you are parvenus, you are of yesterday! We are of Paracelsus and of Galen; but these fellows, we know not whence they are."

American dentists of the first rank have marked out for themselves a distinct course, they have hewed their way to honorable recognition without aid or comfort from the medical profession, and they hold their position independent of that august and learned body. There have been doctors in physics as well as in physic, doctors in music as well as in pharmacy, doctors in law and doctors in divinity. Doctors in dentistry have also come to be known and recognized by the usage of more than a quarter of a century. The legitimacy of the title, and the right to confer it, are derived from the same fountain of sovereign and legislative authority to which other American institutions of learning owe their existence. Whether or no it were wise in the founders of the Baltimore College of Dental Surgery to devise and confer under legislative sanction the title of Doctor in Dental Surgery, is a question it is useless now to discuss; it has been placed by the logic of events in the category of accomplished facts. The title has become known as the distinctive designation of American graduated dentists, and its variation into forms less intelligible and tending to create doubt and confusion (however undesignedly) in the public mind is occasion for regret. But instead of fretting over the non-recognition by medical men of our profession as a specialty in medicine, let the attention rather be occupied in strengthening the position it has

gained, and in so ordering its internal development and discipline that the reproach of being "only skillful mechanics" may be taken away, not alone from the select few, but also from the many. Whoever conceives that the profession or practice of dentistry is incompatible with culture and gentlemanly qualities is wide of the mark, but there have been and still are so many dentists who can claim neither finish of education nor elegance of deportment, that the reproach which they occasion must be borne yet a while longer, until the harvest of their generation is gathered in.

There are certain men of unquestioned abilities, but of unquiet minds, impatient of reasonable progress, who desire, or rather insist, that dental education shall include not merely the knowledge and skill necessary for the proper performance of the duties of a dentist, but adequate preparation to supply every demand for medical skill which his patients may stand in need of. While deprecating such excessive requirements, there is certainly a reasonable limit to which the education of dentists ought to extend, and of which the greater number of graduates come far short.

The cry of "Universality in Education" is an attractive one, but the obstacles to be encountered in any attempt at its immediate realization appear almost insurmountable. The question entangles itself with another, hardly less difficult of solution, namely: From what source may the dentist derive his universality in learning? What institution stands prepared to afford that training which is indicated by the term, supposing it to comprehend the acquirements indicated by the titles A.M., M.D., D.D.S.? It might be easy by individual comparisons, and with no very deep probing of pretensions, to cover these aspirations with ridicule, but such a treatment of the case would indicate an unpardonable blindness to the very great necessity for a higher style of dental education than prevails at the present time. Men educated up to that nominal standard are rare; and even of those who wear the title M.D., those who have any claim to be considered learned in medicine form a very small proportion. Owing to this well-known fact, the use of the title M.D. by dental practitioners is in many cases considered to be an unwarrantable affectation of superior wisdom, not very graciously tolerated by their brethren.

Another of the great difficulties of the position arises from those who without any scholastic training assume, and are by courtesy granted, the title of doctor, both in ordinary intercourse and in the literature of dentistry. Who ever sees a dentist spoken of in an American dental publication as Mister? All are styled doctors, even if unable to write or utter a correct sentence in their mother tongue. Some of the "representative men" of this class, together with their constituents, give utterance to a mass of insupportable statements, and envelop them-

selves in an impenetrable mail of conceit, shocking beyond endurance to others more modest and reticent. And the number of these? "Their name is legion, for they are many." How is this to be set right? In this generation it seems impossible. The hope of arriving at better things lies in the provision which may be made for the future, not in any violent enactments for changing what is at present existent.

That the diploma in dental surgery has been issued with an unhappy facility may be possible; in that case the fault lies as well with those dentists who are anxious that their assistants shall possess "the outward and visible sign," rather than that they shall be well grounded in the principles of their profession. It is not easy to analyze the mental process by which one reconciles himself to the possession of curious and useless titles. In too many cases it is more the desire to hear one's self saluted as "Doctor," than to possess the learning which the title indicates, that is, the incentive to strive after it. While a demand for cheaply-earned diplomas exists, there will be found some ready to supply the demand, until some authority is found to intervene, and say: Thus far, but no farther.

The defect of the dental colleges seems to be that they are in a measure compelled to accept all comers, and the keen competition of a too large number of schools engenders a continual pressure upon the authorities to lower rather than raise their requirements. Were it possible to take from the colleges the power of granting diplomas, leaving to them only the duty of teaching, and sending all students to a competent central board for examination and graduation, this pressure might be removed; the emulation between the schools would then be as to which should prepare its students most thoroughly, and not which should have the longest list of graduates.

Would that some means might be found to convince the majority of dentists of the desirableness, the necessity of raising the standard of professional education to such a point that the degree of Doctor in Dental Surgery might become a passport to reception in the best circles, insuring to the public, professional or non-professional, that the bearer is a man of good education, as well as a proficient in his specialty! By many it is not thought desirable that the dental student should have to seek for technical instruction outside of the dental college. Unhappily, the majority of the medical schools (by the showing of the medical journals) are not so enviable in their reputation as to offer inducements for entering into relations with them; this remark, be it well understood, is not intended to cast any reflection upon those distinguished schools of medicine which shed luster upon that profession. But there being no controlling or supervising power over all those colleges, every one doing what is right in its own eyes, there fails to be full recognition of the merits of the best, from the fear of spurious in-

stitutions, which the uninformed have no safeguard against, nor patent means of detecting. From this great weakness of the medical schools and the medical faculty in America it is desirable that the young profession of dentistry should deliver itself, if possible, before becoming so hampered and unwieldy as to render the attempt hopeless.

Doubtless many are satisfied with the present state of things; and, looking at the subject from a certain stand-point, there is much cause for congratulation. In any efforts for the attainment of better things, care should be taken not to mar what has been done in the chimerical idea that some great and wonderful improvement may be effected immediately. It is necessary rather that those who see defects in the present system should proceed cautiously, first by inducing a general perception and acknowledgment of the faults which exist, and then by applying suitable remedies in a careful and moderate manner. Any attempt to dogmatize on the subject might arouse a state of feeling which would check any advance whatever. Instead of denouncing the dental colleges, let the endeavor rather be made to strengthen the best of them, and to incite them to greater efforts towards attaining a higher scale of study, sending to them well-prepared young men as students. If the emulation can once be established among them as to which shall demand the highest grade of education from matriculants, and present the most thorough instruction on the part of the professors, we shall find ourselves on the right road at last.

It might be exceedingly serviceable if the most influential of the dental societies, the American Dental Association especially, could be brought to take an authoritative position in regard to dental education, and to deliver itself in some proper formula. Were it once definitely said by an authority which could command respect that the course in the dental colleges must be preceded by respectable scholastic attainments, to be followed by an exhaustive study, not of the whole field of medical science, but of the great departments which underlie every special branch, forming a broad and solid basis for the imposition of the acquirements belonging particularly to our specialty, we should at the least have a recognized standard or ideal to work up to.

What is needed is not an enlargement at a single point in the great circle of requirements for the purpose of embracing operations of a particular class in the oral cavity, and calling for special instruction, for which the means are entirely unprovided. This would simply amount to a requisition for further subdivision of labor. There is no question of the desirableness of having persons specially qualified for any given class of operations; it is the constant tendency and the necessity of the times that it should be so. But that the domain of dental practice is sufficiently extended is evidenced by the fact that its various subordinate departments are now portioned out among different

individuals. How many are there ranking at the same time as first-rate in operative dentistry, in the prosthetic department of the art, and also in pathological treatment? Necessity compels some to devote themselves to tooth-filling, and in this one branch, among a dozen men held to be excellent, the methods of one would be impossible to another; while few of them would be drawn from their usual class of operations to give attention to artificial substitutes, for which there is generally in attendance a skillful assistant, while cases of cleft palate, or fractured maxillæ, or other matters out of the usual course, will be referred to operators who make a special study of those lesions.

Granted, then, that it is desirable to organize an earnest and successful effort for the better education of dental students,—and to be successful it must be based on no visionary ideas, but on a solid and recognized basis of fact,—the parties to this movement must be the leading dental societies, the dental colleges, and, above all, the dentists themselves.

The aim should be to place dental education on such a basis that, in future years, when the hinderances shall have been taken out of the way, dental practitioners shall be men of culture, drawn not from the mechanic's bench, but from the class of the refined and educated. The literary institutions which abound in the United States afford the means for the necessary preliminary culture, and for the rest the directors of dental education must redouble their efforts to provide a high and uniform course of special scientific training for the matriculants, with the object of making dentistry the very best taught specialty in medicine or in surgery.

It may be not unfitting to add to the other celebrations of the Centennial year the annunciation of such a future for the distinctively American profession of dentistry. In the past it offers a vista which can be surveyed with no blush of shame. Let the fact stand out and claim the admiration it deserves, that, among her other achievements in the arts and sciences, American intelligence has added another to the professions; for it found dentistry an ignoble craft, and has raised it to the rank of an honorable profession. Its recognition has been ample, by the great ones of the earth; by the emperors and kings of Europe of every tongue; by the princes of the isles of the Eastern seas; by the rulers of the golden Americas of the south, and by the successor of the Pharaohs, in the most ancient cradle of the arts, the sciences, and civilization. Nevertheless, so far from resting in what has been attained, let us rather "count nothing done while aught remains to do."

TIN-FOIL AS A MATERIAL FOR FILLING.

BY A. J. REDERICH, D.D.S., SIOUX CITY, IOWA.

IN advocating the use of tin as a material for filling teeth, I am aware that I step out of the beaten track. It is not popular; it is little known. Tin! The name is not euphonious: it sounds cheap. Patients are almost offended when you propose to use this material in their mouths, and intimate that they can pay for something better, as silver, or bone filling, for instance.

How do they get this notion? I think from the name, and from dentists who are ashamed to call things by their right names,—hence they call it silver-foil, platinum-foil, stannum-foil.

I propose to state some of my reasons for using and preferring tin in many cases. Pure tin-foil is of a bright, silvery color, very malleable, soft, easily conformed to the walls of a cavity; its conducting property about one-third that of gold; it does not readily oxidize, and it is cheap. It is much easier to work than gold, and takes much less time. It fills a place in a dental practice that nothing else can so well fill, especially when one is situated so as to have all classes and conditions of society to operate for, *and it is reliable*. In this it differs remarkably from amalgam. With the latter material I am thoroughly disgusted. I have used it according to the most approved methods, without washing: using a small quantity of mercury,—just enough for crystallization,—packed it with mallet; prepared cavity with as much care as for gold, taking the same precautions as to dryness, and polishing thoroughly, *and my fillings have failed*, lamentably failed; and so have those of some of its strenuous advocates. This I know, because I have made it my business to ascertain. There is one class of teeth in which I would hope for immunity from further decay when using amalgam: that is the dense, hard, yellowish, flinty tooth, filled on the masticating surface, and filled as described. Yet there are cases presenting perfect protection when temporary results only were anticipated. These are rare.

Tin is a material that is reliable in almost all cases where there is no undue wear from attrition, where there is tooth-substance enough to form a good cavity, or, in other words, where you could use soft gold, cohesive properties not coming into requisition for its retention; yet we can use it in these cases, as will be shown.

From experience I am led to believe that the best results with tin are obtained when used in the same manner as non-cohesive or soft gold-foil,—the cylinder, rope, and sometimes the pellet, with the wedge-shape instrument, and deep serrated plugger. Let us fill a lower molar crown cavity; this will best illustrate our method of working. Apply the dam to molar; excavate thoroughly, as for gold; if the cavity is

small, deep, with parallel walls, make a cylinder of No. 4, longer than depth of cavity by one-quarter or one-third, place this in the cavity, and force it to one side with a smooth, wedge-shape instrument; place another one opposite to this, and crowd one between the two; the remaining space can be filled with pellets packed solidly; burnish, cut surplus with disk, and finish. If we should have frail walls, cylinders would scarcely be admissible, as the pressure necessary for their adaptation to the walls would be too great: there would be danger of fracture; here is where I should use the rope cut into proper lengths, or the pellets with serrated plugger.

But the class of cavities which pre-eminently bring forth the nobler qualities of tin are the proximal, such as we find on the posterior proximal surfaces of bicuspid and molars, reaching far up into the gums; cavities the most uncertain when filled with gold, exhausting both to operator and patient, and of necessity very expensive. Let us take such an one, the bicuspid, and fill it; the superior second posterior proximal surface. We first put the dam on the molar, then on the tooth to be filled; we cut through the masticating surface, excavate all decay, cut down all frail enamel, and get good solid walls or margins, just as we do for gold. (Should decay have progressed so far that the intruding gum interferes, this must be attended to before putting the dam in position; whether we cut this out with instruments, or cause absorption by means of cotton, it matters not; it must be done, or the dam could not be forced in position) We now place a wall to this cavity, thereby converting it into a simple one, using for this purpose one of Jack's matrices, or a piece of broken separating file, with temper drawn and ground to shape. The file can frequently be used where the matrix will not work; bending it slightly so as to contour the filling will frequently be found advantageous. If this bicuspid should be of long crown, some trouble will be experienced in getting sufficient light at the cervical margin, where we should be extremely careful to do our work well. To obviate this I use a narrow matrix made of orange-wood, cut somewhat of a V-shape until it fits the place; this I concave with a suitable file, so that when in position it gives the filling a convex surface. I now take a sheet of No. 3 or 4, cut into three or two unequal parts, roll into a rope, and cut into lengths long enough to reach from the wooden back to depth of cavity towards the pulp; with a serrated hand-plugger, chisel-shape, slightly bent, I introduce piece after piece, and press to one side until I reach nearly the center of the cervical wall; the other side I treat in the same way, while the space between is filled with a large, soft cylinder; *this wedges the filling*, and obviates the triangular spaces that would be formed if hard cylinders were used. The filling at this stage is solid, *immovable*. I now proceed with pellets and the chisel-shape plugger,

packing and condensing until I reach the surface of the wood matrix, place in position the steel matrix, and continue packing solidly against the walls and matrix until full. If there is no tooth to antagonize this filling, we have a reliable and durable plug; otherwise the filling will wear away so much that in two or three years a partial refilling will be necessitated.

To obviate this, my mode has been to stop short of completion where some undercut is left (or so shape at the start), and finish up with adhesive gold. I now take out the matrices, apply the thin burnisher, follow with fine sand-paper or emery-cloth (I prefer the latter), burnish again, and finish up with pumice and polishing putty, applied on strips of muslin or linen tape. Our filling is finished, the tipping with gold giving it the resisting qualities of a gold filling, and the durability—how about that? How about galvanic action, disintegration, shock, subsequent destruction of the pulp? 'Tis here that dentists take issue, that the warning comes from our text-books, periodicals, and the profession, that two different metals should never be used in contact, for disintegration of the filling will follow from the effect of galvanic action; that death of the pulp will most likely result from repeated shocks; that it is unscientific, and opposed to the well-known laws of chemical and physical science.

Do these claims hold *in fact*, or only *in theory*? If the former, it would be worse than useless to attempt the preservation of tooth-structure by a combination of metals. It is true that experiments have been made by men thoroughly capable and qualified so far as knowledge of chemistry and galvanism is concerned, but these have been carried on outside of the oral cavity, where no vital forces were taken into consideration.

Mr. Bridgeman states that "the cause of failure at the cervical wall is due to polarization of the metals: the portion next to the gums is in an electro-positive condition, the other extremity, consequently, electro-negative. The first immediate effect upon a polarized metal is to drive the oxygen of the atmosphere to the positive pole, and an acid condition is produced, disintegration results, while by electrolysis the lime is abstracted and removed to other parts, or carried away in solution." To prevent this (the destruction of tooth-substance by galvanic action), Mr. Bridgeman suggests, first, the prevention of polarization; second, to prevent its effects being reflected on the dentine. "The former," says Mr. Bridgeman, "is not by any means difficult, but it requires a thorough knowledge of the laws under which it takes place to adapt the provisions under all the different circumstances required. Insulation, however, is one of the means to be secured. This, too, is the end to be sought in protecting the dentine. Either gutta-percha, waxed tissue-paper, or allotropic sulphur, but, above all, the so-

called *os stopping*, forms an admirable lining for a cavity, where little success could be hoped for from an unprotected amalgam."

This destruction of dentine by galvanic action, as described, occurs when amalgam is the material used. But we find the same effects produced when gold is the filling material, and fillings of *os stopping* sustain even a more rapid destruction at that point than any other material we are acquainted with; that the dentine is protected, and the whole destruction sustained by the filling, is not the case, it requires but little observation to convince one. With gutta-percha the destruction of dentine is almost entirely prevented: so with tin. The reason of this is that gutta-percha is a non-conductor, and tin more nearly allied to tooth-structure, electrically, than any other metal now in use for filling. The nearer we approach tooth-substance in this respect, the more permanent will be the result. That the greatest destruction takes place at the cervical wall of a gold filling is a fact that cannot be denied; nor can it always be explained by defective manipulation; for some of our most careful operators can, and do, perform as perfect work here as in the other parts of the same filling. That portion farthest removed from the free margins of the gum remains unchanged, while this dissolves and leaves the filling unsupported. If the cause of this is not in the manipulation, the operator, if he has done his work well, must look elsewhere for an explanation. This, we have said, quoting Mr. Bridgeman, was due to the polarization of the metal, and subsequent attending results.

There are other views in regard to this. The chemical theory obtains with many, and is held as a satisfactory explanation. That this is sufficient to account for the fact I do not believe. That voltaic electricity plays an important part in the solution of this question I think there is little room to doubt. Leaving aside the theoretic consideration of the question to those better qualified for its solution, I will here state what I know to be facts, and some observations made as opportunity presented in relation to them.

Some five or six years ago I had occasion to fill some teeth for a patient who had a lower first molar filled on the grinding surface with gold and amalgam. This filling had been in some four years; there was no uneasiness, the edges or margins were good, both around the gold and amalgam, except that the amalgam edge was a little more elevated than the enamel.

About the same time, or a little later, a gentleman who had resided in Chicago had a large gold filling inserted in the grinding surface of second molar, right side; subsequently, the posterior proximal surface of the same tooth gave way, and an amalgam filling was inserted, reaching from the margin of the gum at the cervical wall up to the gold filling, in contact: destruction at cervical wall of amalgam; no trouble experienced. I wished to remove the amalgam and fill with gold, but

patient objected, remarking that the filling had been in five or six years and had been all right. Other cases; a young lady: first bicuspid, left side, posterior proximal surface, filled with amalgam two years before, gold on grinding surface in contact; the amalgam does not reach up to gums, but shows a little defective; point of contact with gold all right; no trouble. Middle-aged lady: proximal surface, central incisor, filled with gold; lingual surface, tin-foil contact; both fillings good; been in seven or eight years. Middle-aged lady came to have second superior bicuspid looked at. Found gold filling on anterior proximal surface good, except at cervical margin, with considerable space produced by filing. Wanted a cheap filling inserted and gold to remain. Put in cotton, forced gum out of the way, and filled with Hill's stopping; this was a little over three years ago; last week pressed gum out of the way again, examined filling, took it out for my own satisfaction to see condition of dentine above and under; found perfect protection, no decay; refilled with Hill's stopping. Miss S——: filled teeth three years and a half ago; lower first molar, anterior proximal surface, and portion of crown, with bicuspid in front, with tin-foil; also, first molar, left side, buccal, temporarily with Hill's stopping. Condition two weeks ago: tin in molar worn down about one-third; in bicuspid scarcely perceptible; Hill's stopping good; cut out part of filling in molar; filled upper or occluding portion with gold; there was no decay at cervical margin of molar or bicuspid.

These are a few cases of which I have kept a record. The first-mentioned cases, which occurred five or six years ago, led me to believe that permitting contact of different metals in the same tooth was not a very dangerous mode of practice. I commenced soon after this to insert a number of fillings of tin and gold in contact, as previously described. Six of them I have repeatedly examined, and am satisfied with the results. From them I draw the following conclusions: tin-foil makes a most excellent filling on the grinding surfaces of molars when these do not antagonize; when the cavities are large and deep, the larger portion can be filled with tin, finishing with gold. Tin in buccal cavities of molars makes as permanent a filling as any material now in use. In a cavity out of sight, where there is no danger from wear, and where the shape is such as to retain the filling, tin is as perfect a protection from further decay as any material we now have. Proximal fillings of tin tipped with gold produce no unpleasant galvanic action, and are at least as perfect a protection to the cervical wall as soft gold, and much safer at that point than adhesive. Tin-foil fillings inserted as described are within the reach of many who could not afford the expense of gold, and consequently would lose their teeth; tin-foil being much cheaper than gold, and the time necessary for filling a cavity, as compared with gold, being so much in favor of tin, they are less

expensive and as remunerative to the operator. If we can convince our patients that it is not necessary in order to save their teeth that *gold only should be used*, and that amalgam is very unreliable (of which fact there will be no trouble to convince them), many teeth that are sacrificed would be saved. *This is my plea for tin.*

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society held at the residence of Dr. E. A. Bogue, No. 29 East Twentieth Street, on Tuesday evening, February 15th, 1876.

In the absence of the president, Vice-President Benjamin Lord occupied the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. A. C. Hawes. A gentleman presented himself to me a short time ago, suffering severe pain and with a hard lump opposite the inferior right first molar. I passed an instrument between the gum and the posterior root, and found nodules of tartar; could pass the instrument almost to the apex. My first impression was that the pulp was dead, and the lump was an abscess caused by it, but on removing the tartar the lump and pain gradually disappeared. Is the pulp dead or alive? I never saw a case with these symptoms in which the pulp was alive, as I believe this one is.

Dr. A. H. Brockway. Some three or four years ago a gentleman presented himself at my office with what I supposed was an ulcerated inferior right first bicuspid. The gum was swollen and the person suffering a great deal of pain. I diagnosed dead pulp and drilled into the tooth, but very much to my surprise I found a live and healthy pulp. The abscess continued to discharge, and in the course of a week a piece of the alveolar process about the size of half a pea exfoliated and came out through the opening. Chloride of zinc injected through the fistula completed the cure. This is the only case I have met with where those conditions were manifested and a live pulp existed.

Dr. W. H. Atkinson. I think that the abscess or hardness is no testimony whatever of the death of the pulp. The description that has been given of this case does not convince me at all that the pulp was involved. Dr. Brockway's case is not an infrequent one. I was somewhat criticised for doing as I did for a young lady who was sent to me from Brooklyn. The attempt had been made to extract a right inferior first molar for a swollen face, supposing that the pulp was dead

and was the cause of the swelling. I examined the case, and pronounced the pulp alive, and that we could effect a cure without extracting. I treated the abscess externally. Probing into the abscess, I found a shell of bone that was already dead. I treated it a little while for the necrosis, removed the sequestrum, and effected a cure. Within two years I have seen the patient; the pulp of the tooth is alive, and a little bit of a "stick-fast" on the under edge of the jaw that does not show is the only mark left. This is typical of these cases. We must not conclude the pulp is dead because there is a swelling in the neighborhood, or that there is an abscess formed. I have been disappointed repeatedly in finding very suspicious teeth with living pulps. In examinations you must probe to the end of the root, and then you can undoubtedly determine whether the pulp is living or dead. In many cases you may find that one root has a dead pulp in it and the other a living one. This I have seen frequently in the upper jaw, and occasionally in the lower jaw.

Dr. S. G. Perry. I wish to confirm Dr. Atkinson's statement as to finding a living pulp in one root and a dead one in the other, simply because I have heard a number of persons question it. I have had quite a number of cases of that kind; I would not like to say how many, but so many that it has become an old story with me. I would like to ask what is Dr. Atkinson's method of determining the vitality of a pulp.

Dr. W. H. Atkinson. There is no way to determine except a thorough examination. I have had negative results, and afterwards found the pulp was living. A young man who had been in the hands of several surgeons, who diagnosed necrosis from dead pulp, was placed in my care. The case proved to be caries of the left ramus; there were eight fistulous openings in the cheek. On injecting fluid into one opening, it would run out at seven other points. The pulp finally proved to be living. I refer to that as a case where negative manifestations were obtained. There was no evidence of extra sensibility, or even as much sensibility as usual. Afterwards, in filling the tooth, I ascertained it had a living pulp.

Dr. C. E. Francis. I have here a cast of a mouth which I wish to pass around the room. The lateral incisor is some distance back of where it ought to be, and the root of it seems to point toward the center of the mouth; the right superior cuspid has not yet appeared. The question is, how to best regulate these teeth; or, what is best to do with the lateral incisor? Would any force draw that tooth into line, provided room could be obtained, the root being so far back? The case is that of a boy ten years of age.

Dr. J. E. Latimer. A lady who has been practicing medicine in Ohio for several years came to me the other day to have her lower

jaw examined. I found a small point extremely sensitive to contact with an instrument. She came again the next morning, and said that the point was exceedingly sensitive when she ate anything sweet or sour. Her mouth was to all appearances edentulous, every tooth having been extracted. She had been told that there was carious bone there, and believed so herself. This point, whatever it was, did not touch her plate, but it occasioned the most excruciating pain to press upon it or to touch it with an instrument. From its being sensitive to sweet substances, I felt pretty certain it was not bone; her teeth having been removed, and this being so far under the gum, it could not be more than the *point* of a root; at the same time I felt some doubt about the possibility of a root retaining its sensitiveness to sweet and sour substances. On that account it is an extremely singular case. Upon further examination I very soon discovered that it was the root of a tooth, which I removed. The patient had suffered greatly from neuralgia, and was very much prostrated upon this day, the paroxysms seeming to start from that point (the root must have been an inferior left cuspid) and run down the left arm; at times both arms would be so affected that she could not use them at all. She is recovering now,—constantly improving,—and is hopeful of being freed from the neuralgia.

The lady gave me the history of the case, which is in itself exceedingly singular and instructive. It seems that both her parents are living and have good, sound teeth, as have also her brothers and sisters. Her teeth were good with two exceptions,—one incisor had lost a corner in a railroad accident, and had been neatly built up by a dentist in Cleveland. In 1867 she suffered severe pain in one of her teeth, and consulted a dentist in Cleveland. She made the remark to him that we often hear, "I would rather have every tooth in my head out than suffer as I have been suffering." The scamp taking his cue from that, went to work and extracted all her sound teeth. A cousin of this lady being with her, secured the teeth against the protestations of the dentist. For several weeks the patient was "out of her head,"—a large part of the time entirely unconscious.

Dr. Harding, President of the Ohio State Dental Society, learning about the case, caused the prosecution of the dentist, and obtained a judgment against him of two thousand five hundred dollars.

This root was left in at that time, and she has suffered, as I have told you, from neuralgia ever since. The root I split into four pieces, and not a vestige of the pulp was to be found, not even at the end.

Dr. W. H. Atkinson. I am impressed with the idea that there is a great deal in this lady's case that is mental; that it was not really such a condition as we denominate sensitive dentine. I do not know any physical law by which to explain it without the pulp being still alive in the tooth; I guess you will find this lady to be a hyperbolean. We

must learn, before we condemn men on ex-parte statements, to look into the evidence. Charges similar to this may easily be brought against the very best of us.

Dr. J. E. Latimer. The court and jury tried him and gave a judgment against him.

Dr. W. H. Atkinson. That may be unjust; we do not know enough as experts to always lead a court and jury to the truth. My impression is that this is a case not to be relied upon as instructive, if we depend upon the patient more than the case itself. I am impressed with the idea that she is one of those persons who, when they are hurt, are hurt very badly.

Dr. J. R. Goble. At our last meeting we were talking about irregular dentition being hereditary. Some time ago, before the First District Dental Society, I gave the history of two little girls,—one of them with the upper and lower central incisors, in which the pulps were dead, and abscesses formed at the root of each; the other, simply the two lower incisors. The rest of the family, father and mother, have excellent teeth, as have the three sisters. But about a week ago the mother's sister came to see me, and she had the same deformity, or rather, presented the same peculiarities,—both the central incisors, superior and inferior, were pulpless and abscessed, but decayed upon the cutting edge only. It seemed to be a sort of abrasion. The structure of the teeth was good, the enamel exceedingly dense, as was also the dentine. These cases confirm my opinion that we would find these irregular or abnormal conditions to be hereditary if we could only trace them out.

I had hoped to have a splendid case of third dentition to bring with me to-night, but I am sorry to say that the lady adheres to her teeth so tightly that her son could not inveigle them away. This lady is now in her sixty-fifth year. Three years ago her son, an intimate friend of mine, brought her to my office. The upper jaw was toothless, and she was wearing artificial teeth. She complained of a swelling on the jaw that prevented her wearing the plate. I examined the upper jaw and diagnosed a tooth, and extracted a perfect central incisor. She took it away with her. About three weeks ago she came again, and I extracted a canine and a lateral incisor from the left side.

Dr. ———. Q. Is there any evidence that it was a third dentition?

Dr. Goble. Yes, sir. She has every tooth that she has ever had extracted. She wants to have all her bones buried with her, and she says she means to have them.

Dr. ———. Q. Have you seen them?

Dr. Goble. Yes, sir. I have seen the teeth she has had extracted. The incisors are nothing but roots; the crowns having been worn and broken away. The left canine is a perfectly sound one.

Dr. E. A. Bogue. I received the other day the *Monthly Review of Dental Surgery*, and to-day a letter. As there is an article in the *Review* that some gentlemen present may see, and which the letter bears upon, I will with your permission refer to both. In the notices of new inventions the editor mentions a malleable and quick-setting gold amalgam, as follows:

"From the few experiments we have carried out with it we are satisfied that, so far as we can now judge, it will be a highly valuable material for filling carious teeth. The property of malleability is its special characteristic. A flat pellet one-eighth of an inch in thickness, was beaten out to three times its original diameter; it could then be cut with a knife, and a soft, tough shaving produced, resembling a shaving from a piece of lead. A cavity in a tooth was filled and the surface burnished, a part of the plug was deeply cut away at one edge, exposing the wall of the cavity. By malleting with smooth points we successfully wrought over the more central part of the plug and filled up the cavity we had made, and then burnished the surface once more. In amalgamating the alloy, it is recommended to add an excess of mercury over the quantity generally used with ordinary amalgams, so that the mixture may be quite thin; nevertheless, the plug becomes sufficiently hard in one minute to bear burnishing, and in a little time longer its malleability and toughness become more marked. So far as our experience with this amalgam has gone we can recommend it to the profession with considerable confidence; desiring, however, to be deliberate before we give an absolute judgment upon a preparation that requires time, experience, and observation for its properties and utility to be known."

My correspondent gives as *analysis*: tin, 56; cadmium, 31.5; copper, 5.2; gold, 5.2; silver, 1.3; iron, $\frac{1}{10}$; and a trace of zinc and arsenic.

Here is a nut for your "electrical theory of decay men" (as my correspondent says). I read this simply to call attention to a mistake that we are all very prone to commit: jump at the conclusion that one thing or another that may be presented to us is all right for our use, because for the first day or two, or perhaps even a month, it seems so.

In respect to amalgams, those who have experimented with them at all carefully know that some of them are liable to change their forms even after days or weeks have gone by; and it is desired also to call attention to the number of constituents that somehow or other manage to get into our amalgams.

The secretary then read a paper on "Lacto-phosphate of Lime; Pathology and Treatment of Exposed Dental Pulps and Sensitive Dentine," by Junius E. Cravens, D.D.S., of Indianapolis, Indiana.

An idea is apt to so envelop the originator that he sees but one side

of it, so that I may hope to be leniently judged if I have failed to view the outside of a theory of practice the honor of whose paternity has been accredited to me.

My experiments with lacto-phosphate of lime began in the winter of 1872-73, in topical treatment of sensitive and soft or demineralized dentine, and pulp exposures. Previous to that time I had tried various methods of dealing with this knotty little problem, principally applying carbolic acid in various solutions.

My failures and otherwise with carbolic acid were not unlike those of other operators in character or numerical proportion; but so bad was that proportion that I felt constrained to abandon a practice that, so far as the delicate tissue treated was concerned, was little short of the *moxa*, and so fruitful of unsatisfactory results.

Even when a student of dentistry it was not very lucid to me why so violent and destructive an agent as carbolic acid or its equivalent should be so generally resorted to in efforts to preserve alive the exposed pulp; and this question became even more opaque when the self-same drug began to be used for the extermination of the pulp by those practitioners who proposed to preserve it by the same means. In this connection I am reminded of the fabled anchorite who expelled the belated traveler from his hermitage on a stormy night because the stranger warmed his benumbed fingers by blowing upon them, and directly cooled his soup by the same means. The recluse declared he would shelter no man who blew hot and cold with the same breath.

Carbolic acid is not a constituent of dentine, neither is cork nor gutta-percha. Nature may tolerate them under certain circumstances, but it is already a forced compliance. When the pulp has been exposed it does not ask for any caustic agents, it is already too near destruction. What it does want is bone-material, food that may be converted into ossific matter; pabulum, if you please, to assist in replacing lost structure.

The original covering of the pulp was dentine; the principal constituents of dentine are cartilage, organic, and phosphate of lime, inorganic, matter; the former being formed within the body, whilst the latter must be obtained from external sources. From this point of observation it seemed to me that the phosphate of lime was the proper material to be supplied by the dentist, but how or in what form to present it was my dilemma. It is true the alimentary canal had been suggested, but then life is entirely too short to render that route practicable to supply the pulp with sufficient phosphate of lime to enable it to cover its own head.

A certain medical journal contained an extract of a paper written by one M. Locke on "Syrup. Calcis Lacto-Phosphatum." M. Locke's idea

was to predigest the phosphate in lactic acid before introducing it into the alimentary canal. If predigesting rendered this bone salt in a fit condition for the absorbents and for assimilation, why not carry it directly to the pulp, in sufficient quantity, all ready for assimilation whenever it enters in solution with the plasmic element of the blood? When the pulp is punctured, a drop of blood exudes; when the drop of blood clots, a contraction of fibrin forces plasma to the surface. This liquor sanguinis, the fluid element of blood, holds in solution the salts that are distributed by the circulation throughout the body. This fluid is the mother of all nutrition, of all development, and any substance that is to be assimilated into animal tissue must first make peace with the blood plasma. Therefore, when the plasma comes to the surface of the clot over the exposed pulp, give to it the lacto-phosphate of lime. I believe that assimilation will take place locally, and that nature will utilize the material given, and by her mysterious process of development stretch a bony covering over the exposed surface of the pulp. My first experiment demonstrated this, and subsequent observations have only served to confirm the opinion.

When the lacto-phosphate of lime is applied to an exposure of pulp, it should be carefully sealed up with *os-artificiel*, and left undisturbed for several weeks. One application usually suffices for small exposures; large ones may require more. So much for exposed pulps; we will now pass to the consideration of *sensitive dentine*.

I do not know exactly to what pathological cause dental hyperæsthesia is attributable, but when I find this exalted sensibility I usually observe the softened consistency of the cavity parietes. Softened dentine is rendered so by the loss of its inorganic constituents, therefore I believe extreme sensitiveness of dentine to be due to demineralization. When equilibrium of organic and inorganic constituency of dentine is preserved, sensibility will remain normal. Now, as the mineral or animal element predominates, just so will the sensibility of dentine be obtunded or exalted. My treatment of sensitive dentine is based upon the above diagnosis. You may say that I use logic to bolster up my doctrine, but then, how often is it the case that logic is medicine's only friend!

In order to secure a paste consistency of lacto-phosphate of lime, I add to it enough of the powder phosphate to thicken as desirable. The paste thus formed will harden in the cavity of the tooth after a time, and the longer it is left undisturbed the harder it becomes, until a maximum is reached.

In excavating, care should be observed that all softened dentine be left undisturbed, except to dry it with some bibulous substance. The lacto-phosphate of lime will infiltrate and occupy this soft, fibrous-looking tooth-bone, and, hardening there, becomes intertubular substance,

not unlike that which was lost; it also enters the ends of the softened and enlarged tubuli, and, hardening there, effectually plugs them. Thus we have secured density and insensibility by establishing a preponderance of mineral where the organic element was in excess.

In soft white dental caries there will be observed in deep cavities a mass of spongy sticks or fibers lying in the base of the cavity. The dentist notes its moist, spongy character, and cuts it away; the pulp is thereby exposed, because nature left that pile of sticks as a last barricade against the enemies in the cavity of caries.

Now, if instead of removing the demineralized dentine that still stands sentry over the pulp you would simply absorb its moisture, and dress the cavity with the paste of lacto-phosphate of lime, after a week or more you will discover that the demineralized sticks and soft fibers have taken unto themselves hardness and density, and that you have simply utilized and perfected a capping provided by Dame Nature herself.

If any fluids of the mouth gain access to the lacto-phosphate in the cavity, a violent toothache is liable—even probable—to ensue, so that it is best in every instance to first adjust the rubber dam. The saliva should never be allowed to enter the cavity from the time this treatment begins until completed by filling.

I do not believe that the dental pulp is exposed in over five per cent. of cases by caries, and then only by that known as soft white decay; the ninety-five per cent. of exposures being made by the excavator or caused by external violence. So firm have I become in this belief that I seldom expose pulps of late, and consequently have very few upon which to experiment.

To those who are desirous of experimenting with or trying this method of treatment of pulp-exposures and sensitive dentine, I would suggest that they get from some manufacturing chemist the phosphate of lime in the *magma*, which is its soluble condition; a small box of powder or dry phosphate of lime; and some of Merck's lactic acid. The *magma* should be bottled and covered with water, and always kept so, and tightly corked. The bottle of lactic acid should be tightly stopped. A couple of drops of the lactic acid will dissolve about the same quantity of the *magma*; the solution is effected by rubbing in a few minutes, and is known as lacto-phosphate of lime. To this solution add the powder to any consistency you may desire, and apply as I have directed.

Supplemental.

Having previously reported divers cases wherein I treated sensitive dentine and exposed pulps with the lacto phosphate of lime, I will now content myself with detailing the last two that have been perfected under my care, omitting all that have heretofore been given publicity to.

The first in order is that of a young lady of twenty-two years. In this instance the treatment was for soft, fibrous dentine and exalted sensibility. The tooth was a left inferior molar, with a cavity in it extending from the posterior gum line to the sulcus between the anterior cusps; of course, between these limits the grinding surface and posterior proximal wall were gone. The lingual and buccal walls were standing intact, as was also the anterior portion of the crown.

Occupying the base and lying against the anterior wall of the cavity was an unusually large amount of partially demineralized dentine in all the various stages of demolition, from fibrous, spongy masses in the center to the harder cheese-like suburbs attached to the cavity parietes. Hyperæsthesia was manifestly in possession wherever the excavator touched dentine, and to such an extent did this condition obtain that I was in a manner forced to defer the introduction of a permanent filling and devote myself to the treatment of the dentinal sensibility, if possibly it might be permanently obtunded, whilst at the same time it was altogether desirable that the large amount of softened dentine should take on again sufficient density to be utilized as a base for filling upon. Experience with this character of decay has taught me that to remove the soft, moist, fibrous, or cheesy mass from the center of deep cavities is to expose the pulp in most cases.

The treatment pursued in this case was the removal of all foreign matter, such as food, etc., from the cavity, leaving the softened dentine clean and undisturbed; the absorption of as much as possible of the moisture from the saturated demineralized mass, and the thorough drying of the cavity; after which I introduced the *paste* of lacto-phosphate of lime, rather thinly mixed, so that the surplus of the solution might infiltrate readily throughout the meshes of spongy dentinal debris. I removed the moisture from the surface of the paste in the cavity, then I placed a couple or more thicknesses of oiled bibulous paper over the paste, and protected the whole with os-artificiel. The idea in using the oiled paper was to form an obstruction to the encroachment of oxy-chloride of zinc.

There was no pain attending the operation until the covering of os-artificiel was put on, when the usual chloride of zinc manifestations were felt for about twenty minutes perhaps. No trouble was afterward experienced by the patient, and in about two weeks she reported for the permanent filling of the tooth, which I did with gold. When I opened the cavity at the last sitting, I found the dentine to be far below the normal degree of sensibility, and the formerly demineralized debris was quite hard, and afforded an admirable foundation for consolidating gold upon. This tooth was filled at Indianapolis on the 11th day of October, 1875.

On the 18th day of December, 1875, I treated a case of pulp-exposure

as follows. The patient, a young lady of about eighteen years, was thin and delicate; and, from a peculiar nucleated and semi-transparent growth from the mucous membrane of the lower lip, I thought her to be of cancerous diathesis. The tooth was the right inferior second molar, the cavity was anterior proximal and grinding; the lingual and buccal walls standing. The floor of the cavity extended from the margin of the gum backward two-thirds or more of that diameter of the crown, and about the middle of this plane was the most extensive pulp-exposure I ever have seen. The surface of the pulp seemed to be bare for its entire lateral dimension, and perhaps one-third of the surface antero-posteriorly. By throwing rays of light directly upon the pulp, the pulsations of the circulation within could be distinctly discerned from the fluctuations of the exposed surface.

Although the exposure was caused by my removing the softened dentine from over it, yet the excavator did not wound the pulp. The surface of the pulp was soon covered by a clear fluid thrown out from the organ itself. This fluid I judged to be plasma. Inasmuch as there was already an exudation of the solvent constituent of the blood, it was not necessary to incise the pulp to obtain that desirable fluid. I prepared a few drops of the solution of lacto-phosphate of lime, afterward adding enough powder phosphate to produce the desired paste consistency; this paste I applied directly to the surface of the pulp, and covering in at the same time two crests of cheesy dentine that stood one before and the other back of the exposure. I dried off the surface of the paste, and covered with a couple of thicknesses of oiled bibulous paper; when the water-proof covering of os-artificiel was put on, the chloride of zinc caused the usual pain for a short time.

Yesterday morning (February 5th, 1876) the patient called at my office, that being the first visit from her since dressing the pulp-exposure on the 18th of December last. The interval was exactly seven weeks, during which the tooth had been entirely comfortable.

I adjusted the rubber dam, and then carefully removed the os-artificiel, under which was the oiled paper; removing the paper, I found a quantity of white powder that was evidently the dry phosphate of lime used in thickening the solution to a paste. The powder was *dry* and easily pushed aside; under the powder I found to my delight a dark, bony substance that occupied the entire field of former pulp-exposure. This new bone was of a coffee color, and its surface was continuous with that of the formerly soft dentine, so that it formed a sort of fossa between the two crests of cheese-like dentine before mentioned. The formerly softened or demineralized dentine had become hard,—evidently *re-mineralized*,—whilst the sensibility of the dentinal walls was even below the normal degree. The new ossific matter seemed insensible to the touch of an instrument, but responded readily to a cold blast

from an air-syringe. Dr. P. G. C. Hunt, of this city, is well known to many members of your society, and this, added to the fact of his having been my preceptor in dentistry, induced me to regard him as a valuable witness, so that, the young lady consenting, I escorted her to Dr. Hunt's office, and requested him to examine the case.

The doctor kindly consented to write the statement subjoined, giving the results of his examination of the case, and for which I am truly grateful:

DR. CRAVENS,—I take pleasure in corroborating your statements in reference to the above case,—the most beautiful I have ever seen. The large pulp-exposure being perfectly covered with a hard ossific plate, and the cartilaginous consistency of the dentine around the exposure changed to bone of considerable density, making a good solid floor for a filling.

Thanking you for your kindness in presenting the case for my examination, I am truly yours,

P. G. C. HUNT.

I trust this supplement will afford abundant evidence for the arguments contained in the original paper.

Discussion.

Dr. E. A. Bogue. The question brought up in this paper, it seems to me, is one that should attract the attention of every gentleman here. How much we know about it is another thing. As nearly as I am able to understand his statement, Dr. Cravens expresses the view that a mineral substance is appropriated and put to use near one of the peripheries of the body without having gone through the digestive process commonly so called; that here a local application of lime in a semi-fluid form is made use of in a manner we have ordinarily supposed was utterly impossible.

Dr. A. C. Hawes. Some two or three weeks ago I had a very distressing case of sensitive dentine. I commenced to excavate an extensive but not a deep cavity on the anterior portion of the left lower bicuspid. Every cut of the excavator caused excruciating pain. After several ineffectual attempts to allay the sensitiveness, I finally isolated the tooth as well as I could with napkins, and applied the rhigolene spray. The sensitiveness was immediately relieved, and I was enabled to finish excavating the tooth. There has been no trouble from it since. In using the spray I first fill the cavity with cotton, and only apply it long enough to relieve the sensitiveness of the dentine. I employ it very frequently, and with very happy results.

Dr. W. H. Atkinson. The subject and the paper are both of too

much importance to pass without our notice. As the writer compliments this society for its high standing, perhaps it would not be out of place to take a little introspect into the paper and into the doctrines asserted in it, and the detailed history of the cases. We should lay all prejudice aside when we are making inquiries for truth. Probably the greatest prejudice among men that have the reputation for being learned is, that they will not put away their own preconceptions and prejudgments about almost everything out of the ordinary beaten track that is presented to them.

I have no fault to find with Dr. Cravens's facts, but I wish to enter my protest against his inferences. What are his inferences?—That his jumped-at conclusions are sound. What are the conclusions that we gather from the paper?—That he has succeeded in bringing about a result not heretofore obtained by any method of treatment. He has not named a thing that I have not seen result where lacto-phosphate was not used, and where nothing was used excepting the merest protection,—all the way from gypsum to oxide of zinc mixed up with creasote, so as to form a paste.

I tremble almost to refer to some of his nomenclature and to his osteology. He convicts himself of not being able to take two consecutive steps in the process of either making or unmaking a tooth, and yet the evidence is plain upon the face of it that he is like very many of our best operators and best dentists; with a sharp, clear-cut mind, seizing hold of the surface aspects of the subjects that he handles with a great deal of vigor, and then running through them without perceiving the law, and without perceiving that he is asserting the merest truisms where they are true, and the most blatant falsities where he comes to the conclusion that nature can appropriate from the external that which requires to come from the other direction.

Those of you who wish to see a tooth in the condition which he speaks of can see one at our next clinic, before the First District Society,—a tooth which has been treated, so far as I know, only with the oxide of zinc, formed into a paste with creasote. There were two points of the pulp exposed in this tooth, and one of them is covered so nicely that I cannot detect the difference between the original and the secondary formation. The other is protected by this brown appearance that Dr. Cravens speaks of, where the color of the blood-corpuscles was plainly in sight for weeks before.

He asserts a truism, but utterly misapprehends the true physiological relations which he tells about, when he says that the secondary formation, or this remineralized portion that was demineralized, was not sensitive to contact of instruments, but that it was sensitive on the portion of the dentine that was originally formed. Now, that itself is the testimony, to any one capable of understanding the process, that

this was not an action from the outside, but a real calcification between the living pulp and the fully calcified parts. I have seen this occur under tin and amalgam fillings when the secondary dentine was converted into flinty hardness. The degree of sensitiveness depends upon the length of time the cavity has been protected from external agencies.

I am glad of the testimony he presents, in insisting upon pulps being protected and saved, for it will strengthen the position I have long defended, of not destroying the pulp willfully under any circumstances. This is not a personal matter with me any further than that I wish the truth to prevail, and I wish the man to do the highest good that he can.

As to the indorsement of Dr. P. C. G. Hunt: His testimony is good according to the measure of his intelligence (and he is one of the most intelligent among us); but there are very few of us that are entitled to an opinion. Here an absolute dogmatic assertion of fact has been made, and deductions or inferences put forth as certainties. For instance, see the boyish self-sufficiency as to the dreadful consequences expected to result from the application of creasote or carbolic acid to living tissue! If he knew anything at all about the action or combination that takes place by this application, he would know that it produces a pellicle on the surface that is not soluble in excess of the solvent, so that it is a protection to the underlying tissues, as much so as the lacto-phosphate could be which he proposes. This all surgeons and practitioners have known from the earliest time that carbolates have been in use as escharotics.

I suspect that Dr. Cravens has some homœopathic crotchet in his head; not that I think there is no truth in homœopathy. We have paid too little heed to the "*vis medicatrix naturæ*" that belongs to the system, to the inherent physiological powers of the human body. We ought to be able, if the assertions in the paper are true, to build up a tooth from an exposed pulp. As long as we have a magma of lime matrix left we ought to be able to have it appropriate the lacto-phosphate of lime, and not be required to make any more artificial teeth, but build them on the ruins,—if we can build and add on the outside, as this paper seems rather to infer than assert.

Now, where does the action take place in hardening? Always towards the living supply of pabulum, and the pulp reduces itself by the calcification of the dentino-plasts, continually encroaching upon the size of the pulp-cavity as this process goes on. The essayist does not seem to have taken this into the account, whether he has understood it or not.

Practically, the results mentioned in the paper may be all true, but what is the philosophy of the process? Is it the lacto-phosphate out-

side or the phosphates inside that crystallize? Is it due to the lactophosphate specifically, or would not any other substance that was equally impervious to fluids answer the same purpose?

Dr. A. C. Hawes. I do not understand that this is applied because it is impervious to the action of fluids.

Dr. W. H. Atkinson. Dr. Cravens protects with the oiled paper for the purpose of preventing the fluid chloride of zinc from producing aching, and it is very evident, from a remark he makes in the paper, that he is not as delicate as he might be in his manipulations, for he says, "As is usual, a certain amount of pain results." I never have had pain result when I used a paste of oxide of zinc and creasote,—not in one single case; and in many instances I have put the fluid chloride of zinc directly on an exposed pulp without pain, and had good results.

That this hardening takes place, especially in the recalcifying process in decalcified dentine such as he speaks of, is not new at all. It has been known for a long time, and it takes place very rapidly,—rapidly in many cases. The shortest time I have known a pulp exposed and recovered completely, so that you could not distinguish the secondary from the original formation, was from the 23d of January to the 23d day of February.

Another point: The cavity must be kept dry during the capping process, for if the saliva is allowed to come in contact with the fluid it causes pain. I think I have known pain to result when there was no saliva nor any other fluid but the normal pabulum that weeps out from the cut ends of the dentinal fibrils.

That is a constitutional condition. In some cases there will be pain, and in others there will not be pain by the application of the same agent.

This paper and this discussion ought to be an excellent stimulus to us to study more closely into these actions we pronounce finalities, about which we have hardly yet got the alphabet.

Dr. E. A. Bogue. I wish to ask Dr. Atkinson two or three questions about what he has been telling us. Is there anything else than the peripheral cells of a dental pulp that can throw out secondary dentine?

Dr. W. H. Atkinson. No, sir. If you can hold your minds close enough upon such a small body as we are talking about—so small that the object cannot be seen by the naked eye—I will try to explain the process. Whenever you get lime-salts oozing out from the vessels, they are said to be extravasated; then the dentino-plasts, which the doctor has denominated the peripheral cells (which are the builders of dentinal tissue, and have a special adaptability for taking on density, by successive calcification of the peripheral layer of cells) become calcified, producing the new or secondary dentine. But suppose calcifi-

cation does not take place exactly adjoining one of these peripheral cells, but that it shall exude into the pulp,—anywhere in the body of the pulp,—and the mass of lime-salts brought there come into a state of quiescence, crystallization takes place; then will be formed a pulp-stone instead of secondary dentine. You will find by the microscope that pulp-stones have an annulated appearance indicated by concentric rings of greater or less degrees of ability to refract the light, so that they will look like a section of onion, and this is the evidence that it is not a proper secondary dentine, but a real calcification or consolidation of lime-salts between the blood-vessels,—where they are calcified bodily as you have seen in petrifications.

I have offered fifty dollars in gold for a pulp completely calcified,—an absolute consolidation of it all the way to the ends of the roots. The thing is an impossibility, because there must be some means of carrying these salts that come from the general circulation to the locality, and the means that are provided are blood-vessels; and, after they have exhausted themselves of lime the last time, they leave a little uncalcified tract, and there is still in that tract a living remnant of, or else an atrophied pulp.

Dr. E. A. Bogue. The next question I would like to ask is this: If, then, they be called the peripheral cells that deposit secondary dentine, what is the condition of a pulp that has been sufficiently inflamed to destroy its surface?

Dr. W. H. Atkinson. The condition is just one of degree. If you have a single line of these cells that have been destroyed, then the adjoining cells on the sides will, from the absence of these that are destroyed, project themselves over and close up the gap. Whether they will have any fibrils, I don't know; or whether there will be the pulp *per se* left uncovered afterwards, I don't know; but this fact I do know, that there will in some cases be a little *cul-de-sac* in the dentine,—a calcification showing secondary deposit which closes over the pulp, and that will protect it afterwards. That is what I suspected in this young man's mouth when I examined it, where the cornua of the pulp had retracted, leaving the point of pulp-chamber empty.

Dr. E. A. Bogue. Do you regard the presence of oxide of zinc or phosphate of lime as anything else than a mere protection while the pulp is doing its work?

Dr. W. H. Atkinson. I should always so regard them.

Dr. E. A. Bogue. One point that has been brought out practically to-night, but a point seldom advanced theoretically, is, that amalgam is the poorest conductor of caloric that you can put into a tooth.

Dr. S. G. Perry. I feel like putting in one plea for a method of practice that I am very partial to in connection with the treatment of exposed pulps, and that is, not putting in a permanent filling immediately.

My method is conservative: I never take it for granted that everything is all right until I am *sure* that it is. I fill with gutta-percha generally, letting the fillings remain as long as I think they will be safe, and then remove them and fill permanently. If on removing the first filling I am not satisfied, I refill with gutta-percha, and let it remain until I am satisfied the covering over the pulp is sufficient. I pursue this practice with many teeth that have not the pulps exposed. I let the filling remain, making an appointment with the patient at a suitable time,—three, six, or twelve months,—making the appointment definite, and insisting upon their coming at that time; then I am able to go ahead without much fear of the result.

I do not think three, or six months, or even a year, is sufficient always to determine the success of exposed-pulp treatment. It may with many cases; but many cases are so evenly balanced between life and death that a year may not determine it.

The Chairman. Do you succeed generally in preserving the vitality of exposed pulps?

Dr. S. G. Perry. I think I do usually, for I do not favor the attempt to save pulps unless I feel that there is a good, fair chance for their recovery.

Dr. W. H. Atkinson. What do you call a fair chance?

Dr. S. G. Perry. A slight exposure.

Dr. A. C. Hawes. What do you fill roots with?

Dr. S. G. Perry. I use gutta-percha. I can use that better than anything else, and if there is a necessity for it afterwards it can be removed. I generally carry a little cotton up into the pulp-cavity, just a few shreds well moistened with creasote. I leave that, and then carry up the gutta-percha.

Dr. C. E. Francis. For filling roots I prefer oxide of zinc to any other substance; still, I think it is not very material what filling is used. A gentleman called upon me to have a pivot-tooth inserted. He broke a central incisor when a boy, almost on a line with the gum, and went to a dentist, who removed the pulp and filled the root with dry cotton and put a cap of gold over it. I removed the gold, and to my surprise I found a mass of cotton just as clean and white and sweet as possible. It was put in by a gentleman in this room twelve years ago.

Dr. N. W. Kingsley. I recently took some cotton out of a pulp-cavity, clean, dry, and sweet, which had been there, covered over with gutta-percha, nine years.

Dr. J. R. Goble. I am of the opinion that it does not matter so much *what* we fill with, as *how* we fill. I have seen good results with cotton, with oxychloride of zinc, with gold, and with tin foil.

Dr. E. A. Bogue. I also have seen good results from cotton. I have

a specimen here, and I would like to pass it around. [Showed tooth with cotton protruding three-eighths of an inch through the foramen.]

Dr. E. A. Bogue called the attention of the society to the last clause in our last year's Transactions, in which Dr. S. S. White offers a dental engine for the best answer to the following question:

"The pulp of a tooth being deprived of a portion of its normal protecting wall, it has been observed that tissue analogous, apparently, to dentine, has been deposited in the orifice, closing it entirely, and thus restoring the condition necessary to the preservation of the pulp.

"This result having occurred occasionally, it is important to know whether any one substance used as a covering has been more frequently followed by such deposits than when others have been used.

"Is the necessary amount of lime held in solution in the blood of all healthy persons? If so, how can the vital forces of the part be stimulated to make a reparative deposition, as is done when fractured bones are properly set and protected?

"Can this action be induced? or is it only necessary, in order to obtain such deposits generally, that the pulps should be freed from all irritating agents, and be protected by a wall, securing it from foreign substance and abnormal thermal changes?"

The best answer to that question will still bring, I understand, one of those dental engines.

Dr. S. G. Perry. I would like to ask Dr. Atkinson to give us his method of filling roots?

Dr. W. H. Atkinson. Take the measure of the length of the root by an instrument which has a hook or turn at the end, so that you are sure you get through the foramen, and then by slipping back and forth catch the hook over the edge of the hole in the end of the root; then you will be able to mark accurately the length, by a scratch or file-mark on the shaft of the instrument. This being withdrawn serves for test for length of root. Now enlarge canal with a wheel-bur, so as to secure a slight shoulder very near the point of canal. Cleanse out all *débris*, and pack the end of root with a few fibers of cotton wound on a small root-filler or dressing-needle, sopped in a cream of oxide of zinc and creasote, being careful to take precise measurements so as to *know* when you have accurately filled to the foramen.

Reverse the twist by which the cotton was secured to the needle, and withdraw, tapping down so as to set the cotton and paste firmly against the shoulder made by the wheel-bur, and then fill root with oxychloride of zinc.

Dr. E. A. Bogue exhibited one of Fletcher's ingot moulds, a little device containing a black-lead crucible or shallow cup, in which an ounce or less of gold may be melted by means of the gas blow-pipe, and, when melted, by a movement of the handle, run at once into an

ingot which is attached to the crucible, so that in eight or ten minutes gold scraps may be transformed into an ingot ready for the rolls.

A foot-bellows and blow-pipe: by means of which this melting may be done, the soldering of metallic plates, or other blow-pipe operations, without fatigue to cheeks or lungs; the whole being accomplished by the movement of the foot.

A low-temperature burner: by means of which a temperature may be procured so low as to be only warm to the hand, and useful for making solutions or evaporations, or drying models, etc. From this the heat may be increased, until a plate with teeth is made ready for soldering.

Also, one of Simm's electric motors, a little machine that could nearly be put into a man's hat, that, standing on a Morrison bracket, and having the flexible arm of a White's engine attached to it, furnished the motive-power for running the engine; it was also attached to the White's engine direct, without any alteration, by simply passing a band over the driving-wheel, and was found to furnish power enough, and more speed than was required, showing its easy adaptability to the purposes of those who prefer some other motor than the foot for running their engine. This motor was run with three cells of a battery, which are said to require renewal only once in three or four weeks.

Adjourned.

AMERICAN DENTAL ASSOCIATION.

THE sixteenth annual session of the American Dental Association convened at the Methodist Chapel, corner of Broad and Arch Streets, Philadelphia, on Tuesday morning, August 1st, 1876. The meeting was called to order at ten o'clock by the president, Dr. A. L. Northrop, of New York, and was opened with prayer by Dr. Morgan, of Tennessee.

On motion of Dr. Shepard, a resolution was adopted inviting dentists not resident in the United States, whose names may be approved by the Executive Committee, to seats on the floor and to participate in the discussions. Under this resolution, at this time and subsequently, the following gentlemen were introduced: Drs. E. Wilson, Havana, Cuba; W. H. McGrath, Pernambuco, Brazil; N. Emmons, Santiago de Chili; George Cunningham, London; J. Carlos Gardiner, Madrid; William Armstrong Vice, Leicester, England; T. J. Thomas, Madrid; and W. St. G. Elliott, Yokohama, Japan.

The reports of committees were then called for, that upon Physiology being first in order; but the reports not being ready, the special committee on that branch of the subject relating to the health of the dentist, appointed under the resolution of Dr. John Allen last year,

was called upon, and the chairman, Dr. Allen, made a report, which was followed by a voluntary paper by Dr. Brockway. We give abstracts of the papers, as follows :

Dr. Allen's paper said that a heavy dental practice tends to overtax the system more severely than other callings; the reasons assigned being the close confinement, and more especially the numerous intricate operations he is required to perform under trying circumstances, and a neglect to obey established laws. These are often neglected more from indifference than from want of knowledge, but a plea of ignorance will not avail. As we cannot change the nature of our calling, we should make our habits accord with the laws of health. The paper then contrasted the practice of medicine with that of dentistry, as regards their effect upon the health of the practitioner. The variation in the employments of the former, his out-of-door exercise in going from patient to patient, were considered far less taxing than the difficult operations of the dentist, which cause a prolonged tension upon the brain without the recuperative effect of the open air. This, repeated, is liable to result in pathological conditions of cerebral anæmia, and if long continued, in dementia, particularly when the tension is of a chafing character. It is not brain-work, but brain-excitement, that eventuates in disease. The bad ventilation of dental rooms subjects the operator to the ill effects of vitiated air. One and a half hogsheads of pure air are required for the respiration of each person every hour, and if it is denied, the result is death, as has been shown by the historical instance in which one hundred and twenty-three men out of one hundred and forty-six perished in a single night from this cause.

The use of narcotics and stimulants was then adverted to. Their use was condemned as not required for the building up of the tissues, though when required they may serve a temporary purpose. They should be especially shunned by overworked dentists, who may have no reserve force to spare to eject them from the system. A desire for constant increase is begotten by their use, till their well-known effects are brought about; while no increase of the ordinary nutrient materials is demanded by the body in complying with the ordinary law of waste and supply. A stimulant enables the system to use up its stored force, in other words, to borrow from itself; but this loan has to be met, and if it is not, there is a permanent deficit and physiological bankruptcy. In conclusion, the committee recommended that a less number of hours a day be devoted to practice, that as much out-door exercise as possible be taken, and that operating-rooms be large and well ventilated.

Dr. Brockway's paper stated that a well-founded general impression prevails that the practice of dentistry taxes the physical energies and lowers the standard of health in its followers; and this view seemed so important to this body as to call for a special committee on the sub-

ject, and the means (if any) for better conserving the health of the dentist. The melancholy statistics of the paper would tend to alarm us for ourselves or our friends. The object of this paper is to show that there is a more hopeful outlook for the dentist of the future by reason of the improved modern modes of practice. A marked change has taken place in these methods in the last decade, both in the ideas which govern them and in the means and instruments employed. In reference to the change in ideas, the prominence which has of late been given to the subject of amalgam has been observed by some with regret. From being almost proscribed, it comes back to the ranks, emancipated and disenthralled by the genius of scientific and unprejudiced investigation, and takes its place as a valuable and indispensable adjunct in saving a large class of teeth. The change in this respect has been for the benefit of the practitioner in a physical point of view at least, as it saves hours of exhausting effort required in restoring with gold pulpless and more or less broken-down teeth. Another example, not so marked, is the more general use of non-cohesive foil, and the combination of gold and tin, by which the comfort and convenience of the operator are promoted (irrespective of their merits, as compared with cohesive gold), involving far less time. More enlightened and intelligent ideas upon the treatment of nerve cases and irregularity, wedging, etc., also lighten the burden of the practitioner. The employment of an assistant at the chair is also conducive to the relief of the operator, saving him a hundred little steps and movements, besides running the engine and malleting his fillings. The recent improved appliances, the mallet, the rubber dam, and the engine, were then alluded to as doing a vast and incomparable amount of good to the profession in the matter of physical well-being, besides subserving the interests of the patient. They not only relieve the severe and protracted muscular effort, as is the case with the mallet and engine, but the dam spares the mental anxiety attendant upon the operation of filling with napkins,—which was far more exhausting than the physical exertion. These means are destined to work powerfully in favor of the dentist, by lessening and abbreviating his labors, leaving him more leisure to enjoy out-door exercise and recreation.

The subject being open for discussion,

Dr. Kingsbury, of Philadelphia, said that this was a very important subject, as he had found in his own case. The dentist suffers from too close confinement. Brawn is as essential to him as brain, and this he endeavors to gain in his own experience by taking a vacation of some weeks in the summer. If there is any profession which taxes the nervo-muscular system, it is the dental. If the lawyer and the clergyman require a vacation, so does the dentist, as much or more. We live upon too high a grade of social life, in too great a degree of

refinement, which does not contribute to health and longevity. Such men as Agassiz, Holmes, and Emerson have set us the example of leaving the haunts of civilization and going to the wilderness, where they can breathe the free oxygen of nature. The speaker has found great benefit from this course. He spends his vacation among the lakes and mountains, engaged in angling, which is enjoyment and recreation. This course contributes to happiness and efficiency; the loss of the time is compensated by increased health, and if the dyspeptic and exhausted would follow the plan, they would be renovated and recuperated. The remarks of Dr. Allen in regard to stimulants are gratifying, and their truth must come home to us. There is a growing tendency in this country to the use of spirituous liquors, even among the gentler sex. The medical profession can fix their eyes on numbers of their talented members who have gone to a premature grave from alcoholic stimulants. They are good in their place, but their excessive use is evil, and that danger must be guarded against. Though producing a temporary brilliancy, yet a reaction occurs which carries the system below the point of exhaustion. If any class of men should abstain, it is our profession. How can we have a clear brain and a steady nerve if we do not? We must preserve our systems in their best state.

Prof. Barker, of Philadelphia, said that he was disappointed at the position of the committee, although he agrees with some of their views; they have ignored facts. Doubts that the profession is so exhausting; there is in his opinion no profession better calculated to prolong life and develop the faculties; and those now entering it will yet see that this is the case. The chairs in use twenty years ago were low and wide, and the position occupied by the operators then was painful and constrained. Now, what do we see? We must have an unrestrained peristaltic action of the bowels, and the man who has produced a chair that enables the operator of to-day to have this, as the chairs now in use do, deserves the gratitude of the profession. The profession of dentistry develops the man; calls for skill, ingenuity, and thought, a high action of the brain and of the physical system. Besides this, the patients with whom we have to do belong to the best classes, and mould, elevate, and increase the vital force. We may, to be sure, have a child, or some other exhaustive patient; but the next one gives strength. One reason for the prevalence of dyspepsia among us is that we ignore the simplest laws of health; we operate from morning till dinner-time, rush down to dinner, bolt our food, overtax the digestive apparatus, occupy a constrained position, and divert the blood, which the experiments of Beaumont show should normally flow to the capillaries of the stomach after eating; this blood we divert to the arms and other parts of the body. He has met dentists from all over the country, and they spend as little money in the bar-room as any other body of

men; the proprietors of hotels say this also. Alcohol, as a medicine, is priceless; in consumption and some other diseases it is the main reliance.

Prof. Flagg, of Philadelphia, said he knew all about the effects of rum and tobacco; for fifteen years past he had known nothing of them practically; he could speak from experience of both sides, and testifies against their use. Does not believe in the productive power of alcohol; has never seen a case where its internal use has been beneficial; but, on the contrary, has seen any number of cases carried to the grave by it.

Dr. Barker said he wanted it to be understood that he is not an advocate of the use of rum and tobacco; but denies that the best writers do not claim that alcohol has certain nutritive properties.

Dr. Wetherbee, of Boston, is surprised to hear Dr. Barker advocating the doctrine that there is nourishment in alcohol. Our best American and foreign writers, who are level-headed, conclude that alcohol does not nourish. That conclusion is just, and cannot be controverted. The ground has been well gone over in the papers read, and he wishes to hold up the writers' hands. Among the resources for recovery from exhaustion he would place prominently a horse, used both under the saddle and in the carriage. Horseback-riding for the dyspeptic is best, and the harder the horse the better the exercise. He himself uses both. Walking after work he finds fatiguing. Smoking and chewing are generally to be eschewed, though there may be cases where tobacco is a remedy for a terrible disease, and the only known remedy. He has been made sick by the fumes from a patient, which may do more in three hours to break down health than three days' hard work. If he had had the modern inventions thirty years ago, he would have saved several years' time; by the old style of operating, the dentist's days were shortened and made unendurable.

Dr. Kingsbury, of Philadelphia, said that he had not found horseback exercise to compare with the benefits to be derived from the forest and stream. He amuses himself on these excursions by carrying an instrument for measuring the miles he walks, and an aneroid barometer, for measuring heights.

Dr. Morgan, of Nashville. It has been assumed that the refined habits of modern society have deteriorated the public health. That is a wrong name; it is not refinement which has done it, but dissipation, and a disregard of the laws of life and being. He cannot answer for Philadelphia in regard to spirits, but he defends the female society of his State, as well as the male, from the charge of an increasing use of spirits; it is eschewed, and not found on the tables even upon New-Year's day. He was not aware that dyspepsia is peculiar to our profession; but if we follow the advice which has been given us, to go to the chair in the morning, and work till night without eating, we shall

be dyspeptic. Fourteen dentists had died in his State in fifteen years, and of that number ten died of consumption, in a region where that disease is not prevalent; three of the others died from urinary trouble, and out of eight now in bad health, six suffer from lung-trouble. There is a want of free oxygen,—pure air,—and of full nourishing food at proper intervals. There is a constrained position, even with improved appliances, and the abdominal organs suffer. Is astonished at the position of Prof. Flagg in regard to alcohol. The ablest men have not been able to manage typhoid and cholera without it; in the Southern country no intelligent physician proposes to dispense with it.

Dr. Rebwinkel, of Chillicothe, Ohio. The points of the last paper are well taken. He wants to raise his voice against the idea that our profession is a trying one, because if that view is sustained we shall submit to it as our fate. When we meet our old friends of fifteen or twenty years ago, we find them looking so fat and hearty, and so much better than heretofore, that we can hardly recognize them; they do not look as if their profession had exhausted them. Climate and locality have a great deal to do with it. No writers, except Flagg, in his "Pathology and Therapeutics," have touched upon it. He sustains Prof. Barker in not advocating the use of alcohol, but does not object to the use of it in moderation. His olfactories are not so delicate as those of the gentleman from Boston.

Prof. Stellwagen, of Philadelphia. Each position has a certain degree of justice. A certain amount of alcohol is sometimes necessary to stimulate, when the assimilative power is dormant and old cells must be used over. A temporary bridge over a stream is sometimes necessary; so it is sometimes necessary to bridge over a failure of the vital functions. But no physician should ever recommend the use of so powerful a drug without controlling it by stipulating the dose. That is the true medical use of alcohol. To prescribe a glass of whisky at dinner, means whisky *ab libitum*. To work hard all the year is a prodigal manner of living. When a machine needs oiling, it is better to stop the factory before it breaks down. He finds it better to take his vacation as he goes along, rather than to work three hundred days and then search for health sixty-five days. He reserves one afternoon a week, besides Sundays, devoting the half-day to various kinds of recreation. He had learned not to carry his business home with him. Concentration can only be kept up for a certain length of time. It is suicidal to eat heartily in the middle of the day.

Dr. Thomas, of Detroit, said that he had found his health ruined under his former practice of walking a mile to his dinner at one o'clock. He had changed his mode of life: has his office at his residence, goes to his chair at eight o'clock, operates till two, has an hour for consultation, and dinner at three, after which he does no hard work. When he

breaks over this rule he finds it detrimental. He had injured his health by too much walking and spending his leisure time in improving his residence grounds. Does not believe that the practice is the hardest in the world, though he did believe so up to two years ago. Accomplishes more in the hours that he now operates than he formerly did in one-third more time. A man who uses either tobacco or alcohol should be clean about it. Worthy men lose patients by these practices.

Adjourned.

Afternoon Session.

The discussion of the papers read in the morning was continued.

Dr. McDonnell, of Pennsylvania, thought Dr. Allen might be misunderstood; he did not suppose he would object to the use of alcohol as a medicine. Admitting its medicinal value, what medicines are properly used constantly? Dentists must obey the laws of nature, and not be interrupted at their meals. Having his office in his house had resulted in loss of health to him, and he now walks to his meals. It is essential to be clear of patients at these times. One man, however, may be able to endure what another cannot.

Dr. Stockton. The special committee was appointed on the ground of the alleged insanity of dentists. Our calling does not make men insane. Some things lead in a measure that way, and should be avoided if possible. If any one is doing a thing he does not like, is not working for the love of it, he should get out of it. At some times and for some patients we can work with more ease and more successfully than at other times; we should then change patients, for if we operate for those not in accord we shall injure ourselves. Some days he is disgusted with himself and the profession, while at other times he works with enthusiasm. As to liquor, the moral sentiment of the community has changed for the better. Good health is not always necessary to success; he remembers a case of a gentleman in feeble health, from whom he had seen some most perfect operations.

Prof. D. D. Smith, of Philadelphia, knows of no statistics by which we may judge of the healthfulness or otherwise of dentistry. Dr. Morgan's remarks were of that nature, and if followed up would be interesting and useful. He regards the calling as one tending to shorten life. Of the learned professions, the clergyman is the longest-lived, the physician next, and the lawyer next. True advancement in civilization and mental culture tends to longevity. That people attains the greatest average years which attains the greatest mental culture, while living upon true temperance principles. The improvement in dentistry is due not so much to appliances as to the advance in intellectual attainments. Societies and colleges have lifted the calling to a position of great respectability since 1839. There has been a general elevation

of tone throughout the profession of the country; and to it is due increased longevity. Colleges not merely teach the conservation of teeth, but educate in every department, and develop true manhood, and in proportion as they do this they lengthen the lives of dentists. All science shows that alcohol is poison, and can there be moderation in injurious things? It may be used as medicine, as arsenic is, and there it should stop.

Dr. Atkinson. If we could lay aside partisan feeling and endeavor to get at what constitutes food, poison, and remedy, we should be more likely to arrive at correct conclusions. We hear on the one hand that alcohol is nutrient, and on the other that it is a poison. The last speaker cannot justify his dogmatic assertion. We do not know enough to assert positively what becomes of certain substances that disappear when introduced into the system. Austie says that most of them may be collected, but still there is a portion lost. He goes with all who go against the use of alcohol, but does not want to tell a lie to bolster up the truth; he would rather be a simple *truthist*. The profession has waked up as to whether the occupation conduces to health or disease. Each man is entitled to be the best judge of how much he can endure. There is no cast-iron rule. It should be a rule, however, never to draw all our deposits out of the bank, but to keep a reserve, like buckwheat-batter, which will give us a new start. The function of alcohol is to redeem the error of some man who has drawn his last deposit. Any other diffusible stimulant might be as good; red pepper or ginger; but he would prefer as a stimulant to digestion the juice of three well-ripened oranges. Our profession is the profession of professions that awakens all the elements of our being; it is the tip-top blue-blossom of humanity, that restores our patients to soundness.

Prof. McQuillen, of Philadelphia, questions the statements of Dr. Allen, as to the exhausting effects of our profession, and its tendency towards insanity. He questions the propriety of mentioning names, as did the paper of last year. The question is, Is it true? We have too limited a basis of statistics to say definitely. But the evidence seems to prove that it is in the rural districts, among the farmers, that the greatest amount of insanity occurs. Our profession is not more exhausting than any other followed with devotion. Men fall martyrs to other callings so followed.

The report on Physiology was then called for, and Prof. McQuillen made a verbal report on the order of eruption of the deciduous and permanent teeth. He stated that instances are on record of children having been born with teeth; among them was Louis XIV. At the sixth week of existence the first evidence of teeth is presented,—simply a series of papillæ. The follicular stage then becomes the saccular, and the tooth is finally formed and erupted. Whether the gum is removed

by pressure or otherwise we will not now inquire. The central incisors usually erupt from the sixth to the eighth month, and the laterals from the seventh to the ninth month; the first molars from the fourteenth to the sixteenth month; the second molars between the twenty-fourth and thirtieth months. During this period there is more or less systemic disturbance. Is it due to pressure of the advancing tooth upon the gums? It is due rather to the pressure exerted upon the pulp, producing the consequences through the fifth pair of nerves. He called special attention to the fact that the recorded observations of Tomes and Saunders had manifested that eruption of the permanent teeth occurs in America considerably earlier than in England and France.

The report was then opened for discussion.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.

THE eighth annual meeting of the Pennsylvania State Dental Society was held in the Pennsylvania Dental College, Philadelphia, commencing July 26th, 1876. President, Dr. E. T. Darby, in the chair; Dr. S. H. Guilford, of Philadelphia, Acting Recording Secretary.

After the transaction of the usual routine business, the Legislative Committee, through Dr. C. N. Peirce, Chairman, reported that they had obtained the passage of a bill by the Legislature regulating the practice of dentistry in Pennsylvania.

The report was accepted, and the committee discharged with the thanks of the society.

Dr. Peirce then offered the following resolution, which was unanimously adopted:

"Resolved, That for their unselfish, continuous, and successful efforts in the passage of the act to regulate the practice of dentistry in this State, this association, now in session, extend to Drs. McClellan and Wood, of the Senate, and Dr. Morgan and Mr. Vogdes, of the House, their sincere thanks."

The following gentlemen were appointed a committee to make nominations for the Board of Examiners: Drs. Barker, Peirce, Huey, McQuillen, and J. S. King.

Drs. Barker, Buckingham, and Green were appointed a committee to draft resolutions on the death of Prof. E. Wildman. The committee subsequently reported the following, which were adopted:

Whereas, The Pennsylvania Dental Society has learned with unfeigned sorrow of the sudden death of Professor E. Wildman, M.D., D.D.S.; therefore,

Resolved, That the long continued and conscientious labors of Professor Wildman, as teacher, inventor, author, editor, and practitioner, have endeared him to us as a man of rare scientific culture, a valued and honored friend, and a worthy member of the dental profession.

Resolved, That we tender to his bereaved family our heartfelt condolence, and that a copy of these resolutions be forwarded to them as an expression of our sympathy and regard.

The committee on nominations for the Board of Examiners reported, recommending that each of the local societies of the State employ an attorney or solicitor to protect the interests of the profession and properly enforce the new law, and also submitting the names of the following, who were elected by ballot: Drs. Peirce and Beck, for three years; Drs. Darby and J. S. King, for two years; and Drs. Magill and Green, for one year.

It was moved that an invitation be extended to students and practitioners of dentistry throughout the country to attend the meetings of the society.

Afternoon—Clinic.

Dr. Templeton illustrated the use of the King dental malleter, and Dr. Beck showed the manner of using the matrix in approximal cavities.

SECOND DAY.

Dr. Stellwagen made a verbal report (the patient being present) of a case in his practice of the correction of irregularity in the incisor teeth by torsion with the forceps.

Dr. J. S. King read a paper describing a case of surgical treatment of a serious fracture of a superior and inferior maxilla.

Dr. J. H. McQuillen addressed the society on "Neuralgia; its Relation to Dental Irritation."

Dr. W. E. Magill read a paper on "Conservative Dentistry, and Conservatism in Dentistry."

Afternoon—Clinic.

Dr. J. E. Garretson performed the operation of excision and removal of the necrosed portion of the superior maxilla of a young girl.

Dr. M. H. Webb inserted two contour fillings by the aid of the electro-magnetic mallet.

THIRD DAY.

Dr. F. M. Dixon read a paper on "Dental Progress—Failures and Successes."

Dr. Peirce gave the history of a case of necrosis of the inferior maxilla, the patient being present. An operation was performed by Drs. Garretson and Peirce in February of this year. It consisted in the removal of all the inferior maxilla from the condyle on the left side to

the place of the second bicuspid on the right side. The bone was dissected out from the periosteum. A rapid reproduction of new structure had taken place, the amount of deformity being astonishingly small. The patient was a boy about fourteen years of age.

Dr. J. S. King read a paper on the "Capping of Dental Pulpas."

Dr. T. F. Chupein read a paper on "Food."

Dr. B. J. Bing, of Paris, on invitation, explained his method of filling badly-decayed teeth. It consists in filling the cavity with Hill's stopping; then pressing into this stopping a pure gold plate or capping, having loops or staples of platinum soldered to the under side; the cap being well warmed before being pressed into position. The edges are subsequently dressed down, and finished up the same as an ordinary filling. He claimed for this method the perfect salvation of the tooth without discoloration, the appearance of a filling of gold, and great rapidity in performance.

The following were elected officers for the ensuing year :

President.—Dr. J. S. King, Pittsburgh.

Vice-Presidents.—Dr. C. S. Beck, Wilkesbarre, and Dr. G. B. McDonnell, Philadelphia.

Recording Secretary.—Dr. S. H. Guilford, Philadelphia.

Assistant Secretary.—Dr. R. E. Difenderfer, Pottsville.

Corresponding Secretary.—Dr. M. H. Webb, Lancaster.

Treasurer.—Dr. S. Welchens, Lancaster.

Board of Censors.—Drs. T. C. Stellwagen, E. T. Darby, G. T. Barker, and Alonzo Boice, Philadelphia; G. W. Klump, Williamsport.

Board of Publication.—Drs. J. H. McQuillen and G. T. Barker, Philadelphia; J. G. Templeton, Pittsburgh; J. C. Green, West Chester.

Executive Committee.—Drs. Klump, Beck, Barker, Magill, and Hertz.

Minnequa Springs was chosen as the next place for meeting.

Evening Session.

A microscopical exhibition was given at the Philadelphia Dental College. There were twenty-one microscopes, and the following specimens were exhibited :

Dr. Joseph G. Richardson showed, under a one-twenty-fifth immersion lens on a Powell and Lealand instrument, the difference in size between the blood-corpuscles of the ox and of the human being; his idea, which is original with himself, being to arrange the corpuscles of both the ox and man in such a manner upon a single slide as that when brought into the field under high powers any one can decide by the size which is which without any difficulty.

Dr. J. G. Hunt showed, under a Beck's large binocular, the following specimens: Scirrhus in section, showing connective tissue and cancer cells; Pacinian bodies, latex vessels in hop-leaf injected; bone forma-

tion in human fœtus; section of bronchus in calf; transparent connective-tissue fibers; section of frog's stomach, showing muscles and epithelium.

Mr. B. G. Holman showed circulation of blood in the larvæ of the salamander, under a four-tenths objective; also, some life-slides and animalculæ in water, and the circulation of the sap in plants.

Dr. C. N. Peirce showed, under a three-fourths-inch objective, a section of *trichina spiralis*, spiculæ of sponge, and section of human nerve.

Dr. R. Huey exhibited eight microscopes, seven of them being kindly loaned by Dr. Tyson, showing the following specimens: Under eight-tenths objective, tongue of moth-fly; under three-fourths objective, tooth of mylabite; under one-fifth objective, leaf scales of *Sheperdia Canadensis*; under one-fifth objective, *trichina spiralis*; under one-fifth objective, tibio-sarcoma; under one-fifth objective, perpendicular section of the mucous membrane of the tongue of the common deer; under eight-tenths objective, human stomach; under one-fifth objective, transverse section of human radius.

Dr. J. H. McQuillen showed, under a Beck's binocular, two-inch objective, section of an odontome, molar tooth of cat, injected; human incisor, tooth of walrus, lower jaw of rabbit, dilacerated incisor. Also, under Holmes's class microscope, one and one half-inch objective, spinal cord of rat, head of *pediculus humanus capitis*, and bed-bug. Also, under a Zentmeyer class microscope, one and one-half-inch objective, fœtal human stomach, intestine of cat, fœtal small intestine, and calcifying cartilage.

Dr. C. A. Kingsbury showed, under a four-tenths objective, Zentmeyer microscope, a nodule of osteo-dentine.

James W. Queen & Co. showed, under the care of Mr. W. H. Walmsley, on two microscopes of their own manufacture, a section of fœtal stomach under a two-fifths objective, and human lung; also, under a two-thirds objective, R. & J. Beck, the jaw of leech armed with teeth.

Dr. E. L. Hewitt showed, under a one-inch objective, R. & J. Beck, the palate of a limpet.

Dr. T. C. Stellwagen showed, under a one-fifth objective, Zentmeyer, a section of human tooth, dentine and cementum.

The museum of the college was crowded until a late hour with a highly-interested audience of ladies and gentlemen.*

* An abstract of the papers and discussions will be given in a future number of the DENTAL COSMOS.

FIRST DISTRICT DENTAL SOCIETY OF THE STATE OF NEW YORK.

THIS society held its annual meeting on the 6th day of June, 1876. The officers elected for the ensuing year are as follows:

President.—J. S. Latimer, D.D.S.

Vice-President.—J. Bond Littig, D.D.S.

Secretary.—Frank M. Odell, D.D.S.

Treasurer.—Charles Miller.

Clinic Committee—Dr. William H. Atkinson, Chairman, supported by Dr. R. M. Reynolds and Dr. C. E. Latimer.

Dr. Atkinson reported of the clinic to-day, that a case of epulis under the care of the committee is progressing satisfactorily.

There was an exhibition of a White's Engine, driven by the "Union Electrical Motor" power, the same being provided with a brake, enabling the operator to control the movement of the points in the hand-piece instantly; likewise a flexible arm, permitting the position of the motor to be upon a table, or upon a bracket against the wall.

There was a goodly attendance to witness operations by four gentlemen, viz.:

Dr. Charles Miller, who filled the buccal and grinding surface cavities in a superior second molar with soft and cohesive gold, mixed.

Dr. R. M. Reynolds, who filled an inferior right wisdom-tooth.

Dr. M. E. Parrott, of Poughkeepsie, who filled two proximate cavities in left superior central and lateral incisors, using annealed gold.

Dr. William H. Allen, who filled a large anterior proximate cavity in inferior left first molar, over a capped pulp, using Globe gold-foil, No. 6 soft, and No. 4 annealed.

FRANK M. ODELL, *Secretary*.

NORTH CAROLINA STATE DENTAL ASSOCIATION.

THE time for the meeting of the North Carolina State Dental Association has been changed to the second Tuesday in September,—at Greensboro', North Carolina. The profession are invited to attend.

E. L. HUNTER, *Secretary*.

DENTAL SOCIETY OF THE STATE OF MARYLAND AND DISTRICT OF COLUMBIA.

THE Dental Society of the State of Maryland and District of Columbia will meet on the first Wednesday in September, at Ford's Eutaw Hotel, Baltimore. The proprietor has generously reduced his charges to two dollars a day.

R. B. WINDER, *President*.

OBITUARY.

ELIAS WILDMAN, M.D., D.D.S.

SUDDENLY, on July 25th, 1876, Dr. ELIAS WILDMAN, in the sixty-sixth year of his age.

Dr. Wildman was born near Morrisville, Bucks County, Pa., June 8th, 1811; graduated at the University of Pennsylvania 1833; practiced medicine for a short time in Bucks County; served in hospital practice in New York City for some months; studied dentistry with the brothers Birkey, and commenced its practice in 1836. He was elected a professor in the Pennsylvania College of Dental Surgery in June, 1862, and was made dean in 1871. The latter position he resigned in the spring of the present year, but held the chair of Mechanical Dentistry and Metallurgy up to the time of his death.

In the space to which we are necessarily limited it is simply impossible to do justice to the character and attainments of Professor Wildman; but we should do violence alike to our own feelings and to those of our readers if we did not place on record in this journal, devoted to the interests of the profession with which he was so long identified, our estimate of his worth and our sense of its loss.

Dr. Wildman was of such an unaffectedly diffident disposition that his merits were never properly appreciated, except by those who had known him long and intimately. He was not calculated nor disposed to attract attention to himself, and never appeared to so much advantage as when engaged in his laboratory in the investigation of some difficult problem. Under such circumstances his industry was remarkable and his patience inexhaustible.

In 1836—the same year in which he commenced the practice of dentistry—he began experimenting in the manufacture of porcelain teeth. He entered upon the work with great determination, and continued it with unflagging zeal until his efforts were crowned with a success far beyond that of any previous experimenter. He achieved results in the translucency and life-like appearance of his products which had not previously been obtained and have not since been excelled. His most notable success was in the methods by which it became possible to secure uniformity of result in the gum-enamel. After an immense number of experiments he succeeded, in 1839, in obtaining a gum-enamel which has not been surpassed to the present day, as specimens of his work done in that year are still in existence to demonstrate. To Dr. Wildman must be accorded the honor of having been the first to reduce the manufacture of porcelain teeth to a scientific basis.

His experiments with rubber were equally thorough. The results

of these were first published in 1865, under the title of "Instructions in the Manipulation of Hard Rubber or Vulcanite for Dental Purposes." This volume was so much sought for that six editions of it were disposed of.

Not less exhaustive was his experimentation with celluloid. Having visited the factory, and learned by conversation and observation all that could be gathered there relative to materials, processes, and results, he brought home with him specimens of the substance in all its stages. With these and with the finished product he made many and ingenious experiments to determine its properties. It is safe to say that Dr. Wildman probably knew as much of celluloid in its application to dental purposes as any other living man.

These are but illustrations of the manner in which he conducted his investigations in many other directions. A careful observer, a most methodical and exact experimenter, he never jumped at conclusions in the pursuit of information, but arrived at them as the result of plodding, painstaking, persistent investigation, of observation, comparison, reflection, and the record of successive steps or stages in the work.

As a teacher, he was thorough, conscientious, and earnest in his desire to impart not only the mechanical manipulations of the art, but as well a knowledge of the principles involved. His knowledge of the subjects included in the chair of Mechanical Dentistry and Dental Metallurgy was probably not exceeded, if indeed equaled, by any other in the profession. His lectures, if written out, would form a more thorough treatise on these topics than is elsewhere to be found.

As a man, he was honorable, generous, genial, sympathetic; always ready to impart knowledge to those who asked, but remarkably modest and unassuming. He did not appear anxious to make friends or to secure confidence, but those who once learned to trust him never had cause to regret it. The confidence he won he maintained to the end. He occupied and deserved a high position in his profession, and will be long and kindly remembered.

DR. EDWARD W. ROBBINS.

SUDDENLY, at New Brunswick, New Jersey, June 30th, 1876, Dr. EDWARD W. ROBBINS, in the forty-first year of his age. Dr. Robbins was born in Bordentown, New Jersey; was a graduate of the Pennsylvania College of Dental Surgery; enjoyed the reputation of being a skillful operator; had a large practice, and was much esteemed for his manly character and social qualities.

BIBLIOGRAPHICAL.

A HISTORY OF DENTAL AND ORAL SCIENCE IN AMERICA, PREPARED UNDER DIRECTION OF THE AMERICAN ACADEMY OF DENTAL SCIENCE. Philadelphia: Samuel S. White, 1876.

This volume is the outgrowth of action taken by the Academy in December, 1875, to present in some suitable manner the claims of dentistry at the Centennial International Exhibition. A local and an advisory committee were appointed, an arrangement was entered into with Mr. James E. Dexter, of New York, and an address calling upon the profession for information of any kind, of interest or value, was published in the dental journals, and by circular. To these were added the personal efforts of Mr. Dexter and of the committee, the result being incorporated in the volume before us,—a handsome octavo of two hundred and eighty pages.

The following quotation from the preface expresses the intent of the committee and their judgment of the result :

"The book has, perforce, been hastily written; but, as far as possible, no exertion has been spared to insure its accuracy. The committee has labored diligently and earnestly in the revision of Mr. Dexter's manuscript; and it is thought few errors of statement will be found. Expression of opinion by the writer or committee has been sought to be scrupulously avoided, and no unnecessary criticism of persons, books, or methods has been admitted; the effort being to make the work strictly historical, and in no sense didactic. That it contains all the facts cannot be hoped; but that most of its contents will be thought worthy of a place in history,—that it will prove of interest to the present generation in enlightening them as to the work of their predecessors,—and that it will be of value to the future historian and essayist in directing him to sources of information, and as a preservative of the fast vanishing facts of the earlier days of American dentistry,—is fully believed."

The plan of the book was well conceived, its divisions and subdivisions giving opportunity for systematic compilation and facilitating reference to any subject.

After an introductory glimpse at ancient dentistry, and some notice of the founders of American dentistry, the subject of Mechanical Dentistry is treated under the heads of Artificial Teeth, Base Plates, Attaching Artificial Teeth to Bases, Securing Artificial Dentures in the Mouth, and the Laboratory. Next follows Operative Dentistry, which is considered under the headings of Simple Metallic Fillings, Plastic Fillings, Treatment of the Dental Pulp, Anæsthetics, Materia Medica, Extraction and Transplantation, Filling and Regulating, Irregularities,

and Mechanical Devices. The last is subdivided into six sections, as follows: Drying Mouth and Cavities; Cutting and Drilling Instruments; Files, Wheels, Disks; Filling Instruments; Instruments for Extrac-tion; and the Operating Chair. To these are added sections upon the Treat-ment of the more Important Diseases, Injuries, and Natural Defects of the Oral Cavity, Dental Associations, Dental Schools and Colleges, Dental Legislation, Dental Literature, and Dental Education.

We have here given the leading topics as affording the readiest means for a proper conception of the scope of the volume. A copious index enables the reader to refer at once to any special topic. The volume is certainly of exceeding interest to every member of the pro-fession, and must find place in every dental library.

PERISCOPE.

DENTAL SURGERY.—The attempt to bring the influence of the medical profession to bear upon the training of dental surgeons can be of ad-vantage only when medical men are made fully acquainted with the scope and requirements of dental surgery, an accurate knowledge of which they do not at present possess. The existence of special journals, while they render great service in bringing before the dentist all that relates to his calling, tends to remove from the eye of the general practitioner much that he well might know, and more that it is needful he should know, if he would form a just opinion of the present state of dental sur-gery. The absolute necessity for a long special training, in order to acquire moderate capabilities as a practitioner, is very generally over-looked; and the power to pass an examination in surgery and to write a prescription is accepted as a sufficient education for the dental sur-geon. But those whose powers constitute them efficient judges know full well that there is little difficulty in recognizing what is required in the treatment of a case, but very great difficulty in acquiring the power to carry it into effect. To take out a large portion of the soft-ened tissue from a carious tooth, and to fill up the hole with a plastic material, require little skill; but to know the diseased part as fully as may be, to leave the cavity in a form capable of retaining a long-lasting plug, and to introduce that plug; in fact, to perform the operation up to the highest standard of excellence, without an undue expenditure of time, exhaustive to the patient and operator, requires great skill—a degree of skill gained only by patient training, over at least two years, in pupils not naturally inapt. Let any one interested visit the Dental Hospital, and watch the performance of students of one year, then those of two years' training, and, if possible, the operations of the more skill-ful teachers; let him then try his own hand, and all I have stated will be admitted. That which is true respecting filling teeth, applies also to other dental operations. But the dental surgeon will be occupied three-fourths of his time in treating carious teeth; and, if his operations be rightly performed, he will have rendered good service, and secured

the lasting gratitude of his patient. Were it otherwise, we should find the medical practitioners using the leisure hours of their early professional life in the performance of dental operations. In truth, the education of the surgeon does not embrace dental surgery. A man may be a member of the College of Surgeons or Physicians, or of the Apothecaries' Company, and yet know nothing of dental surgery; and it would be unreasonable, and consequently all but impossible, to impose upon him a long and expensive training in a specialty he is not specially destined to practice; and again, the knowledge, if acquired, would be speedily lost, unless constantly practiced. That which would be true in the general surgeon, applies with equal force to the dental surgeon, whose knowledge of general surgery fades from disuse from the time he acquired his general diploma. For his specialty will, if rightly practiced, demand all his time and thought. He cannot remain an effective general surgeon, if he would be a faithful dental surgeon. He may be a legally qualified practitioner; but, without use, the knowledge he acquired up to the level of a pass examination will speedily waste, and he will become morally disqualified.

These facts were fully recognized twenty years ago, when the College of Surgeons instituted its department of dental surgery, laid down a curriculum to be followed by students, and, after examination, granted a diploma of fitness to practice, under the title of Licentiate in Dental Surgery. In this curriculum, certain subjects embraced in the general medical education, but scarcely needful for the dentist, such as midwifery, forensic medicine and botany, etc., were left out, and in their stead the special dental subjects were introduced, leaving the time and cost of the professional studies unaltered. The wisdom of this course is shown in the fact that the dental school, formed to meet the requirements of the curriculum, has from year to year increased the number of its students, who, at the present time, nearly approach one hundred; and that the education meets the necessities of the dental surgeon, is proved by its voluntary acceptance by those whose purpose is to follow dental practice. For it must not be forgotten that the legal powers given to the College in the dental charter are permissive only: hence the education is offered, not enforced. The value of the diploma has been steadily advanced by extending the educational opportunities, by gradually increasing the strictness of the examination, and by the addition of a written to the *viva voce* questions. And the preliminary examination in arts, now required by the medical, before entering upon professional studies, will also be required of the dental student from October, 1877. The Licentiateship is the qualification needed by the dental surgeon, for no other indicates that the possessor is practically acquainted with dental surgery; and surely, if we would gain our living by dental practice, we must, before all else, be skillful dentists. I use the word *dentist*, because the public will call us dentist, do what we will, just as they call the ophthalmic surgeon an oculist; and if we suffer, it will not be by the name, but by our own want of worth. I do not for one moment argue against the dental student taking a general medical qualification. On the contrary, I would urge the student whose means and time will permit, to take the membership or fellowship of the College of Surgeons or Physicians, and I would further advise him to take the B.A. of one or other of our universities. But I do protest against the student making a general qualification stand in the stead,

and take the place of, the special one, if he propose to gain his living by our specialty.

Dental surgery, some years back, suffered greatly from one or other of two conditions. The practitioner had at the outset only a general medical education; or, in many cases, he possessed no education at all. And the suffering is not yet at an end. But the wise course taken by the College of Surgeons has already very greatly reduced the evil; and will doubtless, ere long, to the exclusion of the incompetent, provide the public with a very efficient race of practitioners. It is reasonably hoped that the permissive education, the success of which no well-informed person can deny, will become compulsory; and that a distinctive line will be drawn between the competent and the incompetent practitioner, recognizable by the public. The membership and licentiateship jointly may be said to meet the case, but they involve a higher and more costly education than either, taken singly; and it is not reasonable to expect that all dental students will be prepared to meet the demands of the double qualification. For such, and they will probably form the majority, at least for some time to come, the licentiateship will suffice, as being the educational equivalent of the single qualification in the general practitioner.

There has been much loose talk about the status of the dental practitioner; we had better work more and talk less upon the education of ourselves and our fellows. The Legislature can neither give nor withhold social status. The public will settle the question; and our position will be determined by our individual and collective professional and general culture,—by our professional usefulness and scholarly attainments.—*John Tomes, in British Medical Journal.*

THE DENTAL PROFESSION.—In another column we print a letter from Mr. John Tomes, in which the main points of the discussion affecting the dental profession which has occasionally occupied a portion of our space during late weeks, are set forth temperately and clearly. Our readers will not be surprised to find that we have been in complete accord with the opinions of Mr. Tomes and the party which he represents,—that part in the dental profession to whose labors the specialty entirely owes its present position. With characteristic modesty, Mr. Tomes refrains from mentioning the fact that the good work to which he alludes has been accomplished, through the energy and wisdom of himself and his coadjutors, some of whom, unfortunately, have now passed away. Twenty years ago it may be said there was no dental profession, and the vast majority of dentists were unqualified. There existed, however, a considerable minority of educated professional men pursuing the practice of the specialty, some possessing diplomas, and others, although accomplished dentists, and sometimes men of scientific attainments, without recognized qualifications. This minority, after much discussion, at length united themselves into a body with the object of promoting the advancement of dentistry and rescuing it from the hands of the ignorant charlatan. With this view the Odontological Society was founded; the College of Surgeons was induced to establish a special qualification for dentists; and efficient schools for the education of dental students were organized. Since 1858 the progress of the profession has been continuous, and it has been recruited by a large number of properly educated dentists, much to the elevation of

the specialty and to the benefit of the public. The Odontological Society has continued to form a bond of union between all that is good in the specialty. A scientific body in the main, it has kept a due watch over the professional conduct of its members; comprising all the most eminent dentists, it has not refused its membership to any practitioner duly vouched for as an educated professional man, whether possessing a diploma or not. In this way it has tended to the elevation of the whole body of dentists, its membership being sought and valued as a stamp of honorable position, and many unqualified practitioners have doubtless been induced to practice their calling as a profession instead of as an inferior trade in the hope of meriting the membership of the society. When it is remembered how important is the union of all interests worthy to be united in furthering the progress of a profession under such circumstances, it will be seen that the Odontological Society has acted wisely in not making itself a small association to the exclusion of whatever power and energy was further available. The holders of the license in dental surgery form the largest party in the society, and to some of them dental reform owes most; next in numbers come those without diploma, comprising many excellent dentists. Lastly, the remainder is composed of the comparative few holding full degrees in surgery. Seeing what this judicious combination of available force has accomplished, with such excellent promise for the future, and how equally the credit of what has been done must be divided among all parties, it is easy to understand the resentment which has been aroused by the recent action of a small section of the qualified members of the profession, who, with no real claim whatsoever to a position of leadership, have set themselves up publicly as the sole pioneers of a new departure in the path of reform, and by excluding from their ranks not merely unqualified practitioners, but also the licentiates in dental surgery, insulting by implication an honorable section of the profession, and one to which as we have said the whole body owes, to a great extent, its present respectable position.—*Editorial in Medical Press.*

DENTAL ANÆSTHETICS AND HEART-DISEASE.—I think the explanation of the action of laughing-gas, lately put forth by Dr. George Johnson, ought not to be accepted without further consideration.

In effect he says: 1st. That the fuller and tense pulse, noticed at the commencement of inhaling it, is produced by contraction of the systemic arterioles, and not by the heart being stimulated to unusual contraction. 2d. That the cause of the reduction and final cessation of the radial pulse, at a later period, is the want of blood being supplied to the left heart resulting from contraction of the pulmonary arterioles. 3d. That from the same contraction the right heart, being unable to drive the blood onward is liable to be stretched or over-distended, and to lose its contractile power like an over-distended bladder.

These hypotheses are unsatisfactory to me.

1st. Because I have put to sleep more than eleven thousand persons with laughing-gas without meeting with any case showing signs or symptoms of the heart being dilated by the process; and, although I have not refused to give gas to any one able to walk up-stairs without distress in breathing, I have not had a fatal case. Moreover, I don't know that any death has occurred from laughing-gas in England, unless the Exeter case be claimed for one.

2d. If the increased fullness of the pulse is produced by contraction of the systemic arterioles, how is it that we do not see any paleness of the skin produced at the same time? What is observed is a gradual deepening of color, without any temporary pallidity.

3d. Respecting the contraction of the pulmonary arterioles, the fact that the pulse keeps up long after the blood has become dark, and after consciousness has been abolished, and, usually, even after the breathing becomes intermittent, seems to show that there can, at this stage, be little difficulty in the passage of blood through the lungs. When at length the pulse becomes small and ceases, we need suppose no more, in order to account for it, than that for want of oxygen in the blood the heart's function ceases, as that of the brain had previously done. It may be that the right heart becomes ineffective before the left; it may be, too, that there is some obstruction in the lungs. In the latter case, however, there would be no risk of distension of the right heart, for by this time its contractile power has almost gone. Even if the blood flows back through imperfect valves into the right ventricle, it cannot flow back with greater force than that which sent it forward.—*J. T. Clover, in The Lancet.*

DENTAL ANÆSTHETICS AND HEART-DISEASE.—Mr. Clover raises some objections to my explanation of the action of nitrous oxide gas, and he suggests a different interpretation of the phenomena. We agree as to the fact that the pulse, which for a time is rendered full and throbbing by the inhalation of the gas, subsequently, in some cases,—and in every case where the inhalation is pushed to extremes,—vanishes entirely. I need not here repeat the explanation of these facts which I suggested in *The Lancet* of May 20th.

That Mr. Clover should have given the gas to more than eleven thousand persons without a fatal result is evidence of the care and skill with which he administers that agent, but his great experience is not in itself sufficient to establish the truth of his theory. He states that he has met with no case "showing signs or symptoms of the heart being dilated by the process." I would remind Mr. Clover that *distension* of the heart's cavities does not necessarily imply *dilatation* discoverable by physical signs; but the question arises, What are the signs and symptoms of dilatation of the heart in such cases? It is not unlikely that in persons with normal (not emphysematous) lungs, and with thin chest-walls, careful percussion and palpation might discover some dilatation of the right cavities; but this would be less decided than might *a priori* be expected, because at the time when the right cavities are most distended the left are comparatively empty and flaccid. I have never percussed the cardiac area of a patient narcotized by nitrous oxide; has Mr. Clover done so with a negative result as regards evidence of dilatation? If not, he has no right to assume that no signs of cardiac dilatation exist. Then, as to "symptoms" of dilatation, I confidently assert, from what I have seen of experiments upon animals, that when, during the stage of pulmonary obstruction, the systemic veins and capillaries are sufficiently distended with venous blood to cause lividity of the surface, the right cavities of the heart, and especially the auricle, are not only distended, but actually dilated, in consequence of the obstruction in front.

I am at a loss to understand the physiological meaning of Mr.

Clover's assertion that, admitting the existence of obstruction in the lungs, "there would be no risk of distension of the right heart, for by this time its contractile power has almost gone." Surely the diminution of contractile power is one of the elements contributing to dilatation of a muscular cavity. Every one who administers nitrous oxide should bear in mind the fact that during the stage of lividity the right cavities of the heart are distended, and probably dilated, and when, as often happens at the same time, the muscles of the trunk and limbs are convulsively contracted, the pressure of the contracting muscles upon the systemic veins drives the blood forcibly towards the right cavities of the heart, and thus increases the distension. Mr. Clover asks why, if the increased fullness of the pulse is the result of contraction of the systemic arterioles, the skin is not rendered visibly pallid? I reply, because the resistance offered by the contracting arterioles immediately excites more forcible contraction of the left ventricle, so that the amount of blood in the capillaries is not obviously lessened.

Mr. Clover's statement that the cessation of the pulse in the advanced stage of nitrous oxide anæsthesia is explained by the failure of the heart's action consequent on want of oxygen in the blood, is a revival of Bichat's long since refuted and exploded doctrine, and it is inconsistent with unquestionable facts, in particular with the condition of the heart's cavities as seen in animals killed by the gas, and the evidence of systemic venous distension afforded by the lividity so commonly observed in the human subject. Moreover, if the cessation of the heart's action were caused by the presence of black blood in its tissues, the circulation could not be so rapidly—so almost instantaneously—restored as it is by the readmission of atmospheric air to the lungs.

The phenomena of nitrous oxide anæsthesia are essentially the same as those which result from apnœa, or, as it is commonly called, asphyxia, caused by the exclusion of atmospheric air. Dr. John Reid, in his famous paper "On the order of succession in which the vital actions are arrested in asphyxia," a paper with which every one who discusses this question ought to be thoroughly familiar, was the first to demonstrate that, while the primary effect of the entrance of un-aerated blood into the systemic arteries is to cause an impeded passage of blood through the minute systemic vessels, and a consequent increase of arterial tension, as shown by the dynamometer, the ultimate result is to call forth so great an obstruction to the passage of blood through the lungs, that while the left side of the heart and the systemic arteries are comparatively empty, the right cavities and the systemic veins are filled to repletion.

Dr. Reid's observations and conclusions have been completely confirmed by more recent experimenters, who have called to their aid that most invaluable agent, curare, by means of which the disturbing influence of the animal's struggles upon the blood-pressure is obviated. I am indebted to my friend and former colleague, Professor Rutherford, for the opportunity of witnessing the phenomena of apnœa (asphyxia) in a curarized dog whose pericardium had been opened so as to expose to view the surface of the various cavities of the heart. The suspension of the respiratory movements, and the consequent passage of black blood into the systemic arteries, are immediately attended with an increase of arterial tension, as indicated by the kymograph connected with

the tube of a dynamometer introduced into the carotid. For a period of about two minutes the arterial pressure steadily rises, and with this there is seen to occur an increasing distension of the *left* cavities of the heart, the left auricle swelling up and assuming a smooth, globular form like a distended india-rubber ball. Then the phenomena rather rapidly change. The *right* cavities of the heart become distended and dilated, while the left gradually diminish in size, until, at the moment of the animal's death, the collapsed left cavities are almost concealed by the greatly distended and dilated right cavities. Meanwhile, the pressure in the systemic arteries, as indicated by the dynamometer in the carotid, has rapidly fallen in consequence of the defective blood-supply to the left side of the heart resulting from the obstruction in the lungs. In this experiment we have demonstrative evidence of the influence of an impediment which can only result from contraction of the muscular arterioles, in causing not only an increase of arterial pressure, but also distension, and even dilatation, first of the left cavities, and secondly of the right cavities of the heart in the different stages of asphyxia. The phenomena of nitrous oxide anæsthesia are precisely similar, but they occur with greater rapidity, because of the inhalation of that gas the blood is more rapidly deprived of its oxygen than it is by the mere exclusion of atmospheric air from the lungs.

The physiological interest and the practical importance of the subject must be my apology for the length of this communication.—*Geo. Johnson, in The Lancet.*

DENTAL ANÆSTHETICS AND HEART-DISEASE.—I am glad to find Dr. George Johnson, in his reply to my objections to his remarks on the effects of laughing-gas, does not mention any case in which death or over-distension of the heart has been caused by it. He "confidently asserts, from what he has seen of experiments upon animals, that when, during the stage of pulmonary obstruction, the systemic veins and capillaries are sufficiently distended with venous blood to cause lividity of the surface, the right cavities of the heart, and especially the auricle, are not only distended, but actually dilated, in consequence of the obstruction in front."

I need scarcely observe that when the chest of an animal is opened and the inhalation continued after the disappearance of the pulse, something worse might be expected than when the administrator watches the beating of the pulse to guide him as to the time for withdrawing the gas. The appearance is certainly very alarming, but I think it not improbable that if, after witnessing the dilatation, Dr. Johnson had allowed a supply of air to enter, the right heart, notwithstanding its apparently dangerous dilatation, would have resumed its natural size.

The practical question, whether there is a risk of injurious distension of the right cavities of the heart from the use of nitrous oxide as an anæsthetic, is, I submit, to be settled by the now enormous experience we have had of its effects upon the human frame, rather than by a physiological experiment, performed under conditions that are not found in practice.

The fact that there has been so remarkably little complaint of the after-effects of the gas obliges me to think that the fears which experiments of the kind mentioned by Dr. Johnson naturally excite, are greater than they need be.

I do not deny that the pulmonary arterioles are *contracted* under the influence of laughing-gas. They cannot be *closed* so long as the radial pulse is perceptible. I suppose that the reason why so little blood passes through the lungs at an advanced period of inhaling is that the right side of the heart has lost its ordinary contractile power, from not being supplied, through the coronary arteries, with oxygenated blood. This diminution of heart-power is not allowed for by Dr. Johnson. He would probably admit its existence as I do that of pulmonary obstruction. We differ only as to the relative importance. Dr. Burdon Sanderson affirms this loss of power in his admirable paper on asphyxia in the *Physiological Handbook*. He describes the contraction of the arterioles, but says that no very obvious change in the condition of the heart and vessels occurs till the convulsive struggle commences. He also attributes the dilatation of the heart partly to its weakness from want of oxygen.

If I am right in believing that the pulmonary vessels are not entirely closed, the blood must flow on to the left auricle as soon as the right ventricle is fully distended. This is indeed the fact, for, in examining animals killed by asphyxia, the left cavities of the heart contain blood; according to Dr. B. Sanderson, as much as two-thirds of that in the right cavities. To my suggestion that the weakness of the heart lessens the risk of dilatation, Dr. Johnson says, "Surely the diminution of contractile power is one of the elements contributing to the dilatation of a muscular cavity." Of course it is, but it is not mere distension, but injury to structure, which is the point in question. I imagine that the greatest danger of strain or rupture is when the muscular fibers are most tense, and that they are most tense during the systole. In diastole, or in paralysis of the muscle, the non-muscular structures would bear as much pressure as under the circumstances would be applied to them.—*J. T. Clover, in the Lancet.*

RADICAL CURE OF SALIVARY FISTULA.—The following case is reported from the clinic of Dr. E. M. Bartlett, in the *St. Louis Clinical Record*. The obstinacy of the lesion renders the account of much value:

J. H., aged ten years, suffered from an abscess beneath the right ear, at the lower margin of the parotid gland, and applied to a physician for treatment. A free incision was made, pus evacuated, and the patient relieved. The incision did not heal completely, leaving a fistulous opening at the most dependent portion of what had formerly been an abscess, and an almost constant discharge was the result.

This condition continued for seven years. Patient applied to me for treatment one month ago. On examination I found a salivary fistula, opening externally and immediately posterior to the angle of the inferior maxilla. Steno's duct had been divided at a point corresponding with its exit from the parotid gland, and there had been formed an artificial channel leading from the gland downward to the lowest part of the incision, as shown by the cicatrix.

My first effort was to explore the duct of Steno. I passed my probe into the duct to within about three-fourths of an inch of the fistula, where I met an obstruction. Beyond this point the duct had been obliterated. I then cut down, from without, to the point of the probe. I then passed a needle, armed with a strong silk thread, from the open-

ing just made in the cheek to a point about a line above the fistula, penetrated the artificial channel above the fistula, and, turning the point of the needle downward, brought it out at the fistula, allowing the thread to remain as a seton. In this way I hoped to make an artificial duct from the fistula to the artificial opening just made. After thirty-six hours I removed the seton and passed a small-eye probe along the track of the seton from the artificial opening to the fistula, then armed the probe with a silk thread, having a knot in one end, drew the probe backward and out, leaving one end of the thread on the outside of the cheek at the artificial opening, after having buried the knot at the other end in the artificial channel above the fistula, and then closed the fistula with a suture externally. After the artificial duct from the fistula to the artificial opening in the cheek had been sufficiently established to permit the saliva to flow out freely upon the cheek at the artificial opening, I was ready for the next step in the operation. I then moved the fistula forward on the cheek and closed the fistula behind the angle of the jaw. I wanted to know certainly that an artificial duct had been established from the fistula to the opening made in the cheek before I proceeded further, else I should have brought the thread forward through the natural duct and finished the operation.

I next passed my probe backward through the duct from the inside of the mouth to the artificial opening in the cheek, armed the probe with a silk thread, and again withdrew it, drawing the thread through the natural duct, leaving one end of the thread on the inside of the cheek suspended from the natural opening of Steno's duct, opposite the second upper molar, while a knot in the other end of the thread retained that end in the artificial opening. I then closed the opening in the cheek with plaster, and the saliva has since been flowing out at the natural opening. Both external openings have healed. The saliva readily followed the thread, the thread acting as a conductor, hence I preferred it to silver wire. The cure is radical.—*Medical and Surgical Reporter.*

DENTIGEROUS CYSTS.—Mr. Alfred Coleman read a paper on the pathology of that form of dentigerous cyst dependent upon a tooth which, from misplacement or otherwise, had not been normally erupted. The writer first expressed his views upon the cause of the eruption of the teeth under normal conditions, which he accounted for by the growth of the maxillæ from their nutrient centers to their circumference, at which latter, as shown in many obvious instances, bone was absorbed. The teeth, which were shown in many cases to have their fangs fully formed before eruption, were thus carried beyond the surface until their crowns meet with the opposition of opponents. Where this opposition was not afforded, teeth were exfoliated. These views, as advanced against the old theory that the eruption of the teeth was due to the growth of their fangs, he had advocated in his lectures during and since the year 1865; but he did not claim priority, either for originality or publication over Baumè, who had recently written exhaustively on the subject. Applying these views to the subject in question, it appeared to him that a misplaced tooth, so impacted between the roots of its fellows that it could not be erupted, would, after a time, when the process of bone-formation was less vigorous than at the period of the development and eruption of the permanent teeth, have its sac or that portion of it which surrounded the enamel, but which when that structure was perfected was quite detached from it in the

advance of surrounding bone to the surface, thus leaving a space into which serous fluid, under atmospheric pressure, must be effused. Mr. S. Hamilton Cartwright exhibited several specimens of dentigerous cyst, among them one of a right superior maxillary bone in which the antrum was filled up with a cyst, the walls of which had become completely ossified, a supernumerary tooth being contained therein. He alluded to the various theories held as to the causation and pathology of dentigerous cysts, and said that he could not coincide with Mr. Coleman's view that the parietes of the cyst were the remains of the enamel organ,—a view which had hitherto been generally maintained, though seeming to him to be not quite in accordance with the histology of dental development. Other views were that effusion took place between the remains of the dental and enamel pulps respectively, or between the enamel and the so-termed cuticula dentis; but he thought that it was far more probable that the developmental sac assumed a secreting power after the tooth had been formed, the tooth being thus separated from its walls, the sac occasionally becoming ossified, as in the case he had shown; while in those examples where the crown of the tooth was only included in the cyst, the enamel organ might, perhaps, line the walls of the sac. Mr. Coleman briefly replied.—*Proceedings of Association of Surgeons practicing Dental Surgery, in British Medical Journal.*

HINTS AND QUERIES.

"IN knowledge, that man only is to be contemned and despised who is not in a state of transition." "Nothing is more difficult and requires more caution than philosophical deduction, nor is there anything more adverse to its accuracy than fixity of opinion."—*Prof. Faraday.*

REPLY TO GEORGE DILLON.—To take the "bite" prior to articulation in full cases, *id est*, full upper and lower, take an impression of each jaw and make a model from each impression. Now make a trial plate of wax, or gutta-percha, over each model, and let the plates be fac-similes of the permanent plates. Place a rim of wax around each plate where the teeth are going to be put. Let the rim be sufficiently deep and full to give the proper length and fullness to the teeth. This you do as accurately as you can by your eye. Now place the plates in the mouth, and let the patient close the jaws until the rims touch at some point. Take the plates out and cut away this point, and try again, and so continue until the rims meet all the way around at once. You must judge of the proper fullness and length by requesting the patient to close the mouth and observing whether the expression is natural or not. When you have decided that this is right, let the rims be brought together in the mouth and mark the median line; and also make other marks across the rims to guide you in fitting them together when out of the mouth. Now remove the plates, put the rims together, and pour plaster into one plate, and let it extend back far enough for an articulating end. When this plaster sets, varnish and oil the articulating end, and pour in the other plate plaster, and let it extend back into the articulating end of the first. When the plaster sets, separate the models, and you have the rims and plates as they are in the mouth. Now adapt your teeth, cutting away enough of the rims as you proceed to accommodate them. When the teeth are adapted and fastened on the plates, remove them to the models first made, and

proceed as usual, according to the material you are going to use. If gold or silver work, swage your plates first and proceed as above.—J. F. R. DUFOUR, M.D., D.D.S.

REPLY TO GEORGE DILLON.—To get a correct bite for full upper and lower dentures, take an impression of each jaw, and from them make jaw plaster models. Then make case plates of wax for each, and place around their edges a piece of wax in form and size as nearly like the teeth are to be as possible. Put the plates into the mouth, and have the patient close the jaws. Pare and trim these wax arches until they come together properly and have the desired fullness. Be sure they fit as well at the back as at the front. While still in the mouth, mark them in the center and at each side, so that they can be brought together in the articulator the same as in the mouth. Take the wax from the upper plate, and fit teeth in its place. Then remove the wax from the lower plate, and fit the lower teeth to correspond with the upper ones.—T. J. BULL, *Warsaw, Illinois*.

ANSWER TO C. L. M.—The length of time required for the exfoliation of a dying lower jaw is uncertain; no two cases running the same course in the same time. Keep the parts clean and remove all sequestra. Chlorinated washes are excellent. A new remedy, and an excellent one, is salicylic acid, a disinfectant and a corrector of the diseased action, let it be from what cause it may. I found it to act excellently in a case of necrosis of superior maxillary. It seemed to arrest the spread of the disease, and cause the rapid exfoliation of the sequestrum which was removed by operation. I used it as follows: R. acidi salicylici, gr. v.; sodæ sulphitis, gr. v.; aquæ font., f $\frac{3}{4}$ j.—M. Sig. Syringe two or three times per day. The sulphite of soda renders the acid soluble. It may be necessary to divide some of the soft parts in removing the dead bone, but rarely, or never, from the outside. If the entire jaw is dead, it must be divided at the symphysis, and each part withdrawn separately. A supporting treatment must be pursued if there is much suppuration, or if the disease manifests a tendency to invade the soft parts. Tonics, as iron, quinine, etc., will be indicated, and local treatment to prevent spread of disease. Local treatment, if invading soft parts, would consist in strong caustics or escharotics, as nitric acid, acid nitrate of mercury, etc. The disease is inflammatory, and in its early stages must be treated by antiphlogistics.—J. F. R. DUFOUR, M.D., D.D.S.

REPLY TO B. A. M., ROCKPORT, IND., who asks if any one has been using the celluloid base with plain teeth for permanent cases, making artificial gums of the celluloid. Will the gums thus made hold their color? (They will, if the celluloid is good.) And do the plain teeth adhere to the plate sufficiently well for permanent work? (They will, if properly made.) I always use plain teeth; they make beautiful work; have used them nearly two years with great satisfaction.—J. E. H., *Philadelphia*.

CELLULOID.—Those who have had some experience in manipulating celluloid find that it differs somewhat from rubber, being a little more liable to warp or spring, causing a misfit. In nine cases out of ten this is due, however, to improper working or a misunderstanding of the nature of the material. I will give my method of finishing a plate, which I adopted eighteen months ago. Prior to that time I had many accidents, due wholly to the cause mentioned. After removing the plate from the flask, I remove the metallic air-chamber and cleanse thoroughly the palatal portion of the plate. Into this, after oiling, I pour plaster, making a new model. This I trim up and use as a protection while finishing up my plate. I first remove the plate from the model and trim off any

surplus of material that may be on the edges of the plate; then placing it back on the cast, or model, with file and scrapers work it down to the proper thickness, which can be done by occasionally taking it off for examination; then with sand-paper finish down smooth. I then finish up at the lathe with pumice and chalk. This plan will, I think, insure perfect safety. Of course there will be portions that will have to be finished off without the use of the model, but all parts that can be should be finished while on the model. Another benefit derived from this method is, that you have a model, which should be labeled with the patient's name and laid away. Then at any future time if the plate should happen to get sprung, you have only to immerse it in boiling water, and press back on the model; you then have a tight-fitting plate, which saves you and the patient the annoyance of taking a new impression. With these precautions, and a little experience in the manner of working celluloid, any one may be assured of good results.—R. M. CHASE, D.D.S., *Bethel, Vermont.*

ON THE USE OF THE LEVER IN ROTATING MISPLACED TEETH.—The following method has been attended with success in the writer's practice, and, so far as he is aware, has not been before described:

A cap of gold or other material should be made to fit the tooth which it is desired to rotate. This cap should be open at the sides, so that it will not at all obstruct whatever space there may be between the tooth to be operated on and the adjoining tooth on either side. The material of which the cap is made should be of so elastic a nature and so strong that the cap will clasp the neck of the tooth on the labial and lingual surfaces, much as a tooth is clasped by a rubber dam clamp. If, from the conical form of the tooth, it is not possible to obtain in this way a sufficiently strong hold upon it, the cap may be held in place by tying it firmly with a silk or twine ligature passed around the neck of the tooth. Having thus *taken hold* of the tooth, what is needed is a handle to turn it with. A strip of gold plate or wire should be fastened strongly to the lingual side of the cap, near the neck of the tooth, and extended half an inch or more along the roof of the mouth horizontally, but conforming sufficiently to the surface of the hard palate to avoid the tongue. A hole should be drilled through the free end of this gold strip or lever, and a ligature or elastic having been passed through this hole should be fastened to one or more teeth on the opposite side of the mouth in such a way that the force exerted by the ligature or elastic, when drawn tight, will act upon the lever and powerfully and promptly rotate the tooth, as the rudder of a boat is turned when the helmsman presses with his hand upon the tiller. A few days will suffice to turn the tooth as desired, when the usual retaining-plates may be applied.—HENRY N. DODGE, M.D., D.D.S.

REPLANTATION OF SUPERIOR LATERAL INCISOR.—On the 6th of May, 1876, Mr. —, aged twenty-six, presented himself at my office with the left side of his face very much swollen, with inflammation extending from his lip up to and embracing his eye. Upon examination, I found the lateral incisor so loose in its socket that it could, seemingly, be removed with the fingers. The central incisor adjoining was also quite loose, gum very much swollen and inflamed, with every indication of abscess. Both the central and lateral contained very large approximal fillings on each side. It occurred to me that as there was no other alternative except to extract the tooth, this would be an excellent opportunity to try "replantation." The patient having consented, I extracted the lateral incisor, which was followed by a copious discharge of blood and pus from the socket. Found large discharged sac at the end of fang, with some signs of absorption and consequent roughening at the apex. Having removed the sac,

I washed the tooth in tepid water and then removed it to a bath of carbolic acid and glycerin. I next wrapped it in a napkin saturated in the same preparation, leaving only the apex exposed, and, having placed it in my bench-vise, proceeded to work. Having sawed off the end of the root, I wiped it out thoroughly with carbolic acid, and then filled with gold, burnishing the same at the end of the root. Having removed the coagulum from the socket, I carried the tooth up to its place, and, after holding it there a few moments, I fastened it to each of the adjoining teeth with a rubber band. Patient called the following day. I removed the rubber band and painted the gum freely with iodine, and carried the same up under the margin around the tooth; also painted outside the face with iodine and lead-water. In a few days I had the satisfaction of seeing the swelling entirely reduced, and the tooth almost firm in the socket. To-day, about two months since the operation was performed, the tooth is as firm as any in the mouth, and doing good service, with no signs of returning abscess.—A. H. HILZHEIM, *Jackson, Mississippi*.

HOW TO UTILIZE CELLULOID OIL TANKS.—To make a dry heat apparatus out of one of the celluloid oil tanks, make an iron jacket to fit closely, and to extend one and a half inches below the bottom of the tank. It may be used with gas or alcohol.—J. H.

A SURE GUIDE FOR THOSE WORKING CELLULOID.—Cut off from your plate until it is only a trifle heavier than twice the weight of your base-plate, and you will have just about the quantity needed.—G.

A STILL LARGER MOUTH.—In the DENTAL COSMOS for July, B. H. Teague, Aiken, South Carolina, calls attention to a large mouth, one and three-quarter inches from front to back, and two and three-quarter inches across, and asks, "Has any one knowledge of a larger?" etc. One before me, taken in 1868, of a clergyman's mouth, containing some teeth as massive as the arch is large, measures from front to back two and one-half inches, and from side to side three inches.

I have another, however,—a California production, which measures from front to back three inches, and from side to side three and a half inches. The rise in the palatine arch is three-quarters of an inch. A plate of sheet metal to make a denture for this case would have to be three and a quarter inches by four and three-eighths inches.—T. W.

ANOTHER LARGE MOUTH.—I herewith send a reply to B. H. Teague, Aiken, South Carolina:

I have in my possession the cast of a man's mouth (superior) which measures from front to rear two and one-eighth inches, and three inches across. This man is small of stature, weighing about one hundred and fifty pounds, is "white," is the father of twenty-three children, has his third wife, and is wearing a *full* upper set (fourteen teeth), but has room for more.—C. E. RUHL, *Findlay, Ohio*.

In answer to B. H. Teague, of July number, I would say that we have in our laboratory a plate worn by a gentleman in this town which measures two by three inches. In taking the impression we had to bend out the sides of our largest impression-cup until it was nearly flat.—W. H. RIDER, *Danbury, Connecticut*.

LARGE MOUTH.—To Dr. Teague, of Palmetto State, Greeting: I have an impression in my office, for a case which I made over six years ago, measuring three inches by two; subject, a minister; designed evidently for camp-meeting.—F. A. WILLIAMSON, *Red Wing, Minnesota*.

THE
DENTAL COSMOS.

VOL. XVIII.

PHILADELPHIA, OCTOBER, 1876.

No. 10

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 398.)

It is probably in connection with such potent medicaments as *chloride of zinc* that what may be termed the "magnetism" of practice is most notably demonstrated.

This influence over opinion is certainly one of the most curious, and yet one of the most positive, that we have to contend with in *experimentation*, and the extreme diversity of results which I have referred to as "reported" in the use of oxychloride of zinc in pulp-capping can be ascribed to no other agency.

It is perfectly well known that chloride of zinc is usually a painful application when employed for the purpose of obtunding sensitiveness of dentine, and that "throbbing" sometimes supervenes as the evidence of marked pulp-irritation, even through a thick stratum of covering tooth-bone, and yet we are told by some of the "universally successful" advocates of this material that it *never* produces any pain worth mentioning.

All that I can reply to this is that, as in some other things, I have found a great deal of testimony from patients quite at variance with that of operators, and, indeed, so much appeal has been made to my sympathy, that, with my natural repugnance to the unnecessary amount of pain which is yet frequently given in dental practice, I have feared that my judgment in regard to the use of this capping might possibly be biased by the enlistment of my own magnetism upon the side of exemption from suffering.

I wish it to be distinctly understood that what I have stated in regard to the employment of *oxychloride of zinc* as a pulp-capping

refers to such of its previous use as can be regarded in the light of *demonstration*, and that the record is that of the mixtures which have been used by the profession during the past twelve or fifteen years.

I am thus particular in this matter from the fact that the many desirable qualities of a capping, very analogous to this, have given rise to much *modified experimentation* during the past few years, which I shall refer to in place, but which I can only give as undergoing proving, and can in nowise speak of as reliable practice.

For the most part it will be noted that I have given practice, which, from an experience of many years, I have proven to be reliable. It has been such as I have *demonstrated* in my clinics at the Philadelphia Dental College year after year, and such as I have found productive of satisfactory results in my private practice up to the present time.

In future contributions, this giving of long-tried manipulations and applications will be largely adhered to, but it will be recognized, I hope, that, with the rapid development of our art, it may sometimes prove advantageous to risk that deviation from the relation of what I regard as established fact, which, as in "pulp-capping," shall inform of some of the experimental practice which is being instituted, that the many may add their testimony to that general fund of information which has, as yet, been elicited by the few.

Before indulging, however, in the digression, I must mention gold-beaters' skin as an old-time and well-tried pulp-covering.

This material is most appropriately introduced here, as it forms the connecting link with another *idea*, which, even with this application, is probably most modern in the theory of pulp-capping. I refer to the *idea* of pulp-appropriation of capping material, or organization of the interposed covering.

During the earlier years of the use of *gold-beaters' skin*, it was employed as a peculiarly acceptable covering (as had been demonstrated in its application to cuts, wounds, and burns), and as one of easy adjustment; but of late years, the possibility of its organization has been suggested as an additional argument in favor of its use.

This can only at present be regarded as theoretic, but it seems to me a progressive idea, and, as such, well worthy of mention.

Celluloid in a thin shaving is about the latest purely mechanical pulp covering which has been suggested. I can see no advantage which this material possesses over any others of its kind, and I cannot but regard it as a retrograde step, possessing no scientific basis.

Lacto phosphate of lime.—This peculiarly ingenious and original pulp-dressing is the suggestion of Dr. J. E. Cravens, formerly of Kansas City, now of Indianapolis, Ind.

It was employed by him for the first time during the spring of 1873,

as a capping for an *exposed* pulp, with "the astonishing effect of promoting a new growth of dentine—of repair—over the entire surface of previous exposure in nine days." So reported.

Such an unusual result might well have excited marked surprise, and also that earnest hopefulness upon the part of its author for the desideratum so eagerly sought, as to engender promptly that faith which is so frequently the concomitant of paternity.

With such liberality has this somewhat complicated application been given to the profession, that I deemed it a duty to acquaint myself most thoroughly with the materials used, the mode of their manipulation, and method of introduction, before venturing a line upon the subject, and before hazarding any test experiments in practice.

I am indebted to Dr. Cravens for a very interesting and explicit communication, by means of which I easily obtained the required medications, and have already had six months' experience of the "five years' testing" which I propose for the *lacto-phosphate of lime*.

I have referred to the *modern ideas* which have been engrafted upon the subject of pulp-capping, and, in justice to the author of this application, would state that *his theory* is, that the *soluble* lacto-phosphate of lime (in which form it is secured, by his process of manipulation) is a *food offering* to the pulp, which may be appropriated to the consolidation of softened dentine, or even utilized in the process of self-covering by the pulp, when that organ is absolutely exposed.

This theory cannot as yet be accepted as fact, though it most certainly cannot be successfully refuted by mere denial.

Time and much careful observation will alone determine whether so high a position can, by any possibility, be given the "lacto-phosphate" as to designate it a *pabulum dressing*, but already, I think, it can safely be conceded that it is the most acceptable to pulp structure of all the many coverings which have been suggested.

Three ingredients enter into the composition of "lacto-phosphate of lime" paste, as it is prepared for capping pulps,—

I. Magma phosphate of lime (moist);

II. Merck's lactic acid;

III. Powdered phosphate of lime (dry).

"The term *magma* simply indicates a residue of mud or dregs.

"When bones have been calcined, and the ashes properly washed and treated, the mud left by decantation is the *magma phosphate of lime*.

"If this magma is dried and rubbed in a mortar, we have a nearly insoluble powder; but if the *magma* condition is preserved,—*i.e.*, kept *thoroughly moist*,—the phosphate will remain easily soluble in lactic acid, so long as that condition is maintained.

"The object of the *magma* is to effect the most perfect and strongest

solution of lacto-phosphate of lime in the shortest possible time,"—and, for the accomplishment of this purpose, it is necessary that the magma be kept wet by the occasional addition of water.

Dr. Cravens found, upon trial, that the American or commercial lactic acid deteriorated after a time, in which condition pain was liable to result from its application, and that, moreover, the solution of the magma was not so satisfactory.

It is for this reason that *Merck's* lactic acid is insisted upon as the solvent, as that preparation is found to retain undiminished efficiency. It is stated that the dry, powdered phosphate of lime will yield only about two per cent. to the solvent power of the American lactic acid, and not more than five per cent. to *Merck's* lactic acid, for which reason, it is inferred, the results from this mixture have not been satisfactory.

But the viscid and slightly turbid fluid, which is made by dissolving the magma in the lactic acid, is too thin for pulp-covering, and it is therefore suggested to add a sufficient quantity of the dry phosphate, as a *vehicle*, that a paste convenient to manipulate may be obtained.

Directions for use.—In cases of almost or completely exposed pulps, place on a slab a small portion of magma of phosphate of lime; add about an equal quantity of *Merck's* lactic acid; rub together, and a viscid solution will result almost immediately; to this add sufficient dry, powdered phosphate of lime to thicken it to a proper consistency to be applied to the pulp.

Take the paste upon the end of a probe and apply gently and accurately, "using just enough to form a good covering to the exposure (or the softened dentine), being careful to leave enough space in the cavity to admit of a saliva-proof stopping of oxychloride of zinc, or its equivalent."

Direct pressure must be entirely avoided, and, whenever practicable, the rubber dam should be applied before the capping operation is commenced, to insure complete dryness of the cavity. When this is impracticable, the utmost care should be exercised to secure and maintain the most perfect exemption from saliva possible.

When the lacto-phosphate paste is in position it may be dried gently with bibulous paper, if deemed desirable, and it is suggested to cover it with oiled tissue-paper before introducing the material used for its protection.

In covering with the sulphated oxide of zinc (to be referred to in place), I have not found this precaution necessary.

Although it is claimed that extraordinary rapidity of calcification of tooth-bone takes place under this dressing, it is nevertheless advised that it be not permanently covered, when a *foil* filling is regarded as indicated, for at least a month, or more; and even then the hardened lacto-phosphate paste should not be removed, unless for the express purpose of *examining the result thus far obtained*.

It is this claim of direct pulp-response to the topical application of soluble lacto-phosphate of lime which has, probably, excited the most incredulity in regard to it, and has oftentimes even provoked the assertion that it is absurd; but, as I have stated, mere assertion can neither refute nor sustain.

A lengthy argument of this pretense would possibly be alike injudicious and unproductive of any positive conclusions, but the *idea* I regard as far more worthy of consideration and attempt at development, than of ridicule or doubting disapprobation.

The known results of topical applications are too decided for dispute,—the ordinary effect of iodide of potassium ointment upon glandular enlargements and even extensive indurations is daily witnessed,—while the prompt soothing of pain, the marvelous production of scab, and the subsequent formation of skin-tissue, resulting from the use of red sulphuret of mercury ointment upon the granulations of unhealthy and very painful ulcerations, is even more analogous to the claim under discussion, and is a marked instance of rapid change from unhealthy to healthy action, accompanied with almost incredible promptness of tissue formation.

It is not claimed that skin is made by direct appropriation of any of the medicament employed to produce the result, but this is no argument that skin could not be made with even greater rapidity,—if a medicament should be applied which could be so utilized,—and though it may be regarded as improbable, no proof at present exists that such action is *impossible*.

(To be continued.)

DENTAL EDUCATION.

No. 8.

BY ROBERT ARTHUR, M.D.

UNCONTROLLABLE circumstances have for several months interfered with the continuation of this series of articles, which I will now bring rapidly to a close. I will devote the present number, not for personal reasons, as will appear, to the "Reply" of Prof. Barker, published in the April number of the DENTAL COSMOS, and in a succeeding and probably final paper will offer some views which have occurred to me suggestive of possible modifications in the system I have been examining.

I must premise that the title Prof. Barker has given to his article is, to a certain extent, a misnomer. It is not a "Reply to Robert Arthur, M.D.," but has reference to one only of this series of papers. Some of the others have an important bearing upon the portion of the subject to which Prof. B. refers.

I am reminded that in 1859 I advised Prof. B., then proposing to study dentistry, to attend a dental college, with which I was at the time connected, in preference to a medical college, in order to accomplish his object. This is entirely correct, and I would at the present time give similar advice to any one who proposed to study dentistry, unless he had good opportunities for technical instruction and practical training. It is a mistaken impression, which appears to have been made, that I consider a medical education a sufficient qualification for the practice of dentistry. It is strange that such an impression should exist, as I have endeavored, in strong language, to show how inadequate a medical course is for this purpose, and to make apparent the lamentable ignorance of medical men generally of important features of dental pathology and practical dentistry.

But holding such a view does not oblige me to ignore the fact that the present system of dental education is greatly defective, nor does it admit the idea that I considered the institution with which I was then connected (and which I honestly believed, when I gave the advice above referred to, furnished Prof. B. better facilities for preparing him for the practice of dentistry than any medical college) as capable of furnishing as large an amount of instruction in the general principles of medicine as might have been obtained in a well-conducted medical school. So far, indeed, was I from being entirely satisfied with what had then been accomplished, and especially with what I was doing myself, that I was earnestly and very laboriously engaged in advancing and improving my own course, and anxiously working for the establishment of the very highest standard of graduation and of all the requirements of the school. When I found that retrograde instead of advance movements were proposed in the institution referred to, I withdrew from it.

When Prof. B. refers to himself as my successor, and implies that he has been engaged in teaching the course that I had laid out or followed, and intimates that I then attempted the widely extended course I now condemn, I feel compelled to show that he is mistaken. The position I occupied in the Pennsylvania College in 1859 was not that of "Professor of the Principles of Dental Surgery and *Therapeutics*," but the title of my chair was simply "Principles of Dental Surgery." I did not venture upon the extended range of subjects which Prof. B. has undertaken. I did not touch, except incidentally, the subject of *Therapeutics*. The object of my course was to teach the subject of Dental Pathology and the general principles of medicine, so far as I was capable, and to show the important and intimate relations existing between dentistry and general medicine.

No one who listened to me could, I am sure, have been better aware than I was of the imperfect character of my course, limited as it was. I gave earnest attention to it, however, and was expanding and con-

densing it with every season, until I felt compelled to withdraw from the position of teacher. What my subsequent views might have been, if I had remained in that position, I cannot tell; I can only say that the principal inducement to engage—under unusual circumstances, at a great sacrifice of personal interests—in teaching, was to render such aid as I could in that very important work. And I think it probable that, if I could at any time have been convinced that a different and more perfect system of dental instruction had been devised, I would have exerted my best efforts to aid in its establishment.

But my own personal views and opinions, past or present, are not pertinent to the question under consideration. That question is: Do the dental colleges of the present time meet the requirements and demands of the dental profession and public interests, so far as they are concerned with dentistry? To this question I have replied in the negative, and my opinions merely, in the past or present, must and will be taken for what they are worth, and for no more. The facts I state, and the arguments I employ to support the position I have taken, are all that are worth serious attention.

Prof. Barker declares that my position is untenable, and complains that I have based my examination of his course of instruction upon the "Announcement" of the school to which he is attached. He defines an announcement to be, "Simply a concise advertisement, and intended to give a few general facts, with the understanding, both implied and expressed, that the interested inquirer will communicate with the dean of the college, by whom extended information will be furnished."

Now, so far from having had any desire to deal unjustly in my treatment of the subject of these papers, I feel disposed to claim some credit for having put myself, in this respect, in an unexceptionable position. I have carefully avoided any criticism of either the course of instruction pursued by the colleges or the manner in which it is carried into effect, upon hearsay testimony, and based all I had to say upon statements emanating from the colleges themselves. The "Announcement," as it is called, is supposed to state what is taught in a college, and must necessarily be very brief. It cannot be expected that a syllabus of the lectures of each department of instruction should appear in the announcement, but the general statement of the subjects of which they treat are only required to be sufficiently explicit to set forth, plainly, what is to be taught. An individual entirely unacquainted with these subjects is unable to anticipate how—or to what extent—they will be taught, but to those who have already passed through the prescribed course, their mere announcement is sufficient to indicate their full scope as well as if the lectures themselves were listened to. It will be seen by reference to the articles I have written that I have carefully refrained from making any question of the ability of the individuals, who

compose the faculties of the schools, to teach these subjects. I have only averred that they had undertaken more in the time they had allotted to themselves than it was possible to teach. Is it not abundantly apparent, from Prof. B.'s own statement, that I have succeeded in my attempt? So far from showing that my position is untenable, has he not done more than I have succeeded in doing to establish it? Prof. B. can no longer complain that I have inadequate information, and anything further I may say with regard to his course of instruction will be based upon his own statements.

In referring briefly as I did to his course of instruction, as set forth in the announcement of the Pennsylvania College, I said nothing of *Materia Medica* and *Therapeutics* as a part of it. But Prof. B., in stating what is comprised in his course, tells us that he devotes one-half (thirty lectures) to *Materia Medica* and *Therapeutics*. He then enumerates the subjects to which he devotes the remaining half of his course, comprising thirty more lectures. These have reference to what is understood as "Special Pathology." Of these he states thirty-one distinct subjects, as will be seen by reference to his article. To inflammation alone he devotes, he states, three or four lectures, leaving twenty-six or twenty-seven to the remaining thirty subjects.

Now, I am confident that any one who has given any considerable attention to the subjects relating to special pathology, as furnished by Prof. Barker, will, without hesitation, say that nothing like justice could be done to them in thirty lectures. Prof. Wedl, in his able treatise on "Dental Pathology" in his article on "Neuroses," although he confines his consideration of the subject to derangements of the fifth pair of nerves, furnishes a text for large discourse.

The most important reason, to my mind, why a dentist should receive a medical education to as great an extent as possible is that he may be capable, as I have already urged, of recognizing and appreciating the influence of the teeth as factors of constitutional disorder, and, reciprocally, the conditions under which constitutional derangement are productive of local disorder. Neuralgia is one of the many subjects which, in this relation, requires the most careful and extended discussion. The fact that the teeth so frequently act as exciting causes of this terrible affection renders the subject one, as cannot be too often repeated, demanding careful study by the teacher and elaborate explanation to a dental class. To say that it is passed over in one or two lectures simply means that no attention, at all adequate to its great importance, is given to it. It might, indeed, be made the subject of a large part of a course, if it were possible to devote to its consideration anything like the attention it deserves.

Let any one of the subjects enumerated by Prof. B. be considered with reference to a class of dental students. As I have already said,

the instruction given in these lectures must be very explicit. It must be taken for granted that many of the class are entirely ignorant of the subjects presented, and they must be made very plain (clear) to them. It will not answer to refer them to what are called text-books, as they cannot do more than treat the subjects they attempt to explain in a very condensed way.

The subject of alveolar abscess, embracing as it does the careful consideration of a great number of causes of this affection, is one of so much importance that the most careful instruction with regard to it should be given to a dental student. If I could occupy space enough, it would be easy to make it plain that several lectures might be devoted to this subject without exhausting it.

Diseases of the maxillary sinus is a subject requiring much greater attention than is given to it in any of the text-books. The late Prof. Hayden, who had carefully studied this important feature of dental pathology, devoted a number of lectures to its elucidation. Dentition, and its derangements, is also a subject of wide range and great importance.

The subjects to which I have referred would alone consume more than half of the thirty lectures, if adequately treated. But it is unnecessary to consider this feature of the subject more closely.

I handed the article of Prof. B. to a recent graduate in medicine of one of the oldest schools in the country, and requested, in the light of his recent experience, that he would state the number of lectures he supposed were devoted to these subjects in the school from which he had graduated. He said forty-five, at least, and the instruction was necessarily of a comparatively superficial character. How many would be required to do full justice to these subjects it would be impossible to say.

Prof. B. further states in the "Announcement" that his course embraces "General Pathology, Dental Pathology," etc. When we examine his "Reply," we find that he confines himself to the subjects of *Materia Medica* and *Therapeutics* (thirty lectures), and *Special Pathology* (thirty lectures), these comprising the whole of his course. The subjects he enumerates embrace several which range themselves under what may be classed as "Dental Pathology." But in this enumeration he does not refer to "General Pathology" at all, or to "Dental Caries." If all the other parts of the course were omitted, this latter at least demands elaborate discussion.

It must become apparent, upon the merest perusal of his "Reply," that all I have ventured to say is strictly correct; that in attempting to give any instruction in the general principles of medicine, inadequate as it must necessarily be, for reasons stated, he is compelled to neglect subjects indispensable to the education of a dentist.

I must again say that I greatly regret to have felt myself compelled to refer to individuals. But I must regard Prof. B. as one of the representatives of the present system of dental education in this country, and it must be admitted that we cannot separate any system from the individuals who represent it. They must therefore expect that, so far as they occupy positions as exponents of this system, they will be involved in any criticism the system itself challenges. For Prof. B. personally, and for many other gentlemen connected with the dental colleges of the present day, I entertain feelings of respect and esteem, and very deeply regret that anything which, from a sense of duty, I find myself compelled to say, in the course of an examination which ought to be made, should be considered in any degree offensive. I have undertaken my present task with great unwillingness, especially from the conviction that my motives would be misunderstood, and with the knowledge that I could not avoid touching upon individual interests with all the consequences of ill feeling which that implies. But I am, at the same time, conscious that I have been actuated by no other motive than a desire, from a strong sense of duty, to do, in my own limited sphere, what little good may be in my power for the advantage of a calling in which I feel the deepest interest.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society, held at the residence of Dr. Charles Miller, No. 331 Madison Avenue, on Tuesday evening, March 21st, 1876.

President, Dr. A. L. Northrop, in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. E. H. Raymond. I have a somewhat unusual case, a report of which might be interesting to the members of the society, the patient being a gentleman about twenty-three years of age. On July 7th, 1869, I filled two inferior molars on the left side; the cavities were large, but not very deep; pulps apparently well covered by dentine, and in a normal condition; the cavities were thoroughly lined with gutta-percha and filled with tin foil. I saw the patient several times between 1869 and 1874. In 1874, while doing some other work for him, he called my attention to a small swelling on the left side of the neck, in the region of the maxillary gland, which was very sore to

pressure, but otherwise gave no trouble. The teeth that I had filled were apparently healthy. Thinking that he had taken cold, I did not make careful examination for the cause of the swelling, and dismissed him. In January of this year (1876) he came again. I found a fistulous opening upon the neck, about an inch below the body of the inferior maxillary, and an inch and three-quarters from the angle of that bone. There had been a discharge periodically for about a year, lasting two or three days at a time, and occasionally giving a good deal of trouble, the discharge being quite copious. There had been no swelling at all and no pain connected with the teeth. I supposed one of the pulps, if not both, had died. I opened into the first molar and found that the pulp was alive and apparently healthy. I stopped the cavity with gutta-percha and opened the second molar, the pulp of which I found to be dead; there was but little odor, and no trace of the pulp remained. I syringed the tooth with warm water and applied salicylic acid, stopping the cavity with cotton, and gave directions to the patient to come again in a few days. This was on the 6th, and he came again on the 12th of January, when I found the discharge on the neck had ceased entirely. There had been no pain in the tooth, so that all I did was to open the root and wash it out thoroughly and put in a pellet of cotton, with directions that the patient should come again. He came on the 14th, and I found very little odor, if any,—I do not think there was any; so I put into the root a little cotton saturated with salicylic acid, put in a gutta-percha filling, and directed him to return in two weeks. I did not see him again until the 6th of March. The tooth had not troubled him, and there was not a particle of soreness, but the fistula had opened, and there had been some discharge. I removed the gutta-percha, took the cotton out of the root, and with a fine drill made the attempt to open the posterior root, in which I was partially successful. I washed the root out thoroughly again with warm water and sent the patient home. He came again on the 17th of this month (March). The opening on the neck was entirely closed, and he had had no further trouble there. I saw the gentleman again this morning. The fistula was still closed; but I found just a little pus in the posterior root. I washed it out with warm water, and did not use any other medicinal agent; stopped it with cotton and directed him to come in a week from this time.

The gentleman has had no pain in this tooth except during a night and a day in January of this year, after he came to me. Previous to that time he had not felt a particle of soreness about the tooth. This makes the case seem rather remarkable.

In regard to his temperament, I think you might call it exsanguinous,—a very pale face and a blue, feeble look around the eyes, which would denote that. He has been a student in college uninterruptedly

for eight or ten years, taking very little out-door exercise. I ascertained that there is a little taint of scrofula in the family, although this patient has ordinary good health.

I am sure there is no necrosis in the case; appearances and symptoms indicate the bone to be healthy. I would like to save the tooth if possible.

Dr. J. S. Latimer. With reference to the diagnosis for dead pulp, I had a patient to-day with a superior bicuspid filled with amalgam in two places. The question arose, Is the pulp dead? The tooth was not sensitive under the excavator; but one of Wood's metal instruments heated and applied to it, produced more sensation in it than it did in the adjacent molar, which was undoubtedly alive.

Dr. E. H. Raymond. I would like to say, in regard to those two teeth, that although I could not find any indication of either pulp being dead,—by the usual means, either by pressure or tapping on the tooth,—yet when I came to drill through the fillings, and found the surface of the first one sensitive to the touch, I immediately closed it up with gutta-percha. On opening the second one, there being no sensitiveness, without further investigation I threw a jet of cold water into the opening. There being no response to that, I did not hesitate further. Now, the question is, Would it be wise to stop the tooth up again with gutta-percha so that the place would break again on the neck, and then with a fine probe endeavor to follow the sinus to see just where the difficulty originates? I tried to do that once, but the parts were so very tender that I did not persevere.

Dr. W. H. Atkinson. Did the warm water come out at the fistula when you put it into the tooth?

Dr. E. H. Raymond. No, sir.

Dr. J. W. Clowes. As I understand the gentleman, the parts immediately surrounding the tooth are comparatively healthy.

Dr. E. H. Raymond. They seem so.

Dr. J. W. Clowes. The first thing to do in such a case is to remove the cause. If you remove the dead nerve, which is always the cause of an alveolar abscess, then all you have to do is to fill the cavity properly,—the root and cavity; and all your after-treatment should be from the outside. It has nothing to do with the tooth whatever; you may put in your gutta-percha, and take it out, a dozen times. The way I treat such cases, and succeed with them, is to fill the root with oxychloride of zinc. It has several beneficial results on the tooth. One is, it is a perfect filling itself; next, it is a disinfectant: if a small portion of the nerve remains, it prevents decomposition. Be sure you get the dead nerve out, but be careful in doing so you do not get through the side of the root. Fill it properly with oxychloride of zinc, and let it be a permanent filling. Fill afterwards the crown

with gold, if you like, only use the proper filling for the fangs. Filling with the oxychloride is the whole thing that overcomes the trouble. Since I have been treating roots in the manner I have stated, I do not have trouble with one case in fifty.

Dr. Wm. Jarvie, Jr. You think that it is all owing to the perfect filling of the root?

Dr. J. W. Clowes. The perfect filling of the roots, and the disinfectant effects of this filling.

Dr. Jarvie. How do you introduce the oxychloride of zinc?

Dr. J. W. Clowes. That has caused me a great deal of trouble, yet I think I have overcome it. The object with me was to get the oxychloride in the root up to the point desired. The ordinary instrument for such purposes it would stick to, and be pulled out again. In filling roots, I prepare several very fine pellets of bibulous paper, and, putting a small portion of the oxychloride with a metal instrument into the mouth of the opening, with a blunt instrument of the proper size I press a pellet of paper against it. That forces the oxychloride up into its place. I then take out this piece of paper and put in another small portion, and do the same thing over and over again, until I have filled the root beautifully.

Dr. A. C. Hawes. I have used the oxychloride for quite a long time, and prefer it to any other filling for such purposes, although I fill very successfully without using the paper. I put an extra quantity of the material right over the pulp-canal, and with a small instrument I pump it up and keep pumping it up until the cavity of the root is filled.

Dr. W. H. Atkinson. I wish that the pathology of Dr. Raymond's case could be before all your minds as clearly as it is before my own mind. There is something there besides the death of the pulp. You understand, if it is connected at all with the end of the tooth, there must be solution of lime-salts of the bone, so as to allow a fistulous track. I don't know whether there is a fistulous track, but if the death of the pulp is the cause of the abscess, there will be a track from the point of the root to the opening on the outside. From the condition of the patient, and all things taken into consideration, I deem this case to be one of death by atrophy. In regard to the suggestions as to treatment, I think the instructions not sufficiently definite, nor the orders sufficiently imperative, that the patient should present himself at stated intervals, with the fixed purpose in the mind of the operator to investigate it thoroughly. I never should use warm water nor cold water alone as a dressing in a wound of the flesh. I should always use warm water with a little salt in it in every instance. I should have endeavored to get the water and salt to go through the opening, if possible; that is one of the best evidences of success; and if you cannot get that, and such conditions are present as in this case, I would be careful to go through

the foramen, and then, if it did not heal, the pus would accumulate again; if it had skinned over at the point of the passage, the pus would accumulate,—and so much the better. Then, by seeing your patient at stated intervals, say at least every week, or every third day, you would be able to get sufficient understanding of the locality, and whether the form of the fistula was tortuous, or whether it was really connected with the gland.

Dr. J. W. Clowes. I had a case some time ago in which a central incisor had split off, the fracture extending more than half-way up the root. The gentleman didn't like the idea of artificial teeth, but, having another tooth in a dilapidated condition, I told him he had better have these two teeth out, and have two set on a plate. "Oh," said he, "if you can only fix this one that is not broken, and fix the other one in some way, so I can have one set on a pivot, then I can say I do not wear artificial *teeth*. I don't care so much for appearances, and I would like to have you build up this one that is broken." As he desired it so much, I thought I would try what I could do. I had never seen a case exactly like it, so the question was how I might build up that root. From its peculiar contour, I did not think any one, no matter how great his skill in using gold, would say he could build that up with gold, so I thought I would try amalgam; but the difficulty was, how to fill with amalgam. On the one side there was nothing but the gum to press against. I took a portion of a quill, cut a section of it and inserted it between the root and the gum; there of course I had a wall to build against. On one side was the splintered fang, and on the other side was the quill. I cut the root in such a shape that it would hold the amalgam, using the quill as a matrix. Two or three days later the patient came again, and I drilled a channel for the pivot, and he wears a pivot-tooth there now.

Dr. W. H. Atkinson. Did you leave the quill in or take it out?

Dr. J. W. Clowes. I left it there until the patient came again.

Dr. A. C. Hawes. I would like to describe the method by which I saved a superior molar that became split entirely through the crown, from front to back, so that it was in two halves. I made a little gold belt, drilled a hole through belt and tooth, and screwed it together, having first filled the split with oxychloride of zinc, and it has served the patient well three years and a half, and the prospect is that it will serve him a good while longer.

Dr. C. E. Francis. A few days since, I had an opportunity of seeing a tooth that I filled two years ago. It was an inferior second bicuspid, standing alone. It had formerly been filled on the posterior and anterior surfaces. The cavity in the tooth looked very much like the letter U. There was no wall to fill against, but I found by cutting near the root I could make a slight nick on each side, and I did so, excavating

the cavity as well as possible. I took an impression of the tooth, and made a very heavy silver band to fit snugly around it; I slipped that over for a matrix, and filled the tooth, which is just as good to-day as when I filled it.

Dr. A. C. Hawes. Had it a living pulp?

Dr. C. E. Francis. Yes.

Dr. J. S. Latimer then read the following paper, entitled "Our Duty to Our Profession."

My inquiry to-night shall be, What are the wants of our profession, and what can we, as individuals, do to supply those wants?

Admitted that we ourselves stand far below our ideal; that the great mass of our profession are still more ignorant; that our dental schools are poorly provided with the means of illustrating their lectures; that they cram and send out in a few short months some scores of incompetents, who, duly provided with parchments, go forth to prey upon an ignorant and credulous public; granted all this, and as much more, the question comes home to each one of us, *What can I do to right the wrong?*

Ours is a curious age. The way that leads to happiness is not only pointed out to us, but we are besought, even with tears, to walk in it. The very benevolences which are to be the sources of lasting enjoyment to ourselves and others are all prepared for us, and we have only to open our hearts and purses to bless and be blessed. So in this matter; men who have not been so busy in money-getting that they had not time to think of the general weal, have given attention to the needs of our beloved calling, and to the methods of supplying those needs.

First, then, as to our own culture. No man is so well and thoroughly educated that he knows more than the aggregate knowledge of his fellows, hence it is his duty to himself, his profession, his patients, and his God, to assemble with those who meet in societies, for the purpose of comparing experiences, asking counsel, and bestowing on others the knowledge he may have acquired.

Let him not say, "Oh, those society meetings are dry things, redolent of gas and insipidity." To him belongs the privilege of introducing interesting subjects, and of speaking and writing upon them.

From many years' observation, I am convinced that, strange as it may seem, many gentlemen go to a dental meeting much as they would to a place of amusement in which they pay the entrance fee and passively wait to be entertained as the *quid pro quo* of their money.

Let us trust that none of that kind is here to-night, but that all present recognize that the true object of association is mutual good,—each bringing his store of information for the benefit of the whole. To the clinics and the meetings for discussion, then, let us each bring something, however little, for the common good, thus adding to the interest and profit of the occasion.

Then, again, we should read carefully, and ponder well the various journals and text-books which bear directly or indirectly upon our profession. If we dissent from the conclusions of their authors, the pages of the journals are open to us; if we deem the text-books stupid, we may write *better* ones if we can.

In some sense to-day is mother of to-morrow; and, quite as truly, it rests with the profession of to-day to determine that of the future.

Let me illustrate. If we carefully and prayerfully select the pupils whom we are to supply to the dental schools; if we see that they are fitted physically, mentally, habitually, and by culture to undertake the study of dentistry; and if we then provide them with the necessary instruction in the theory and practice of our profession to fit them to enter college, the schools will not be supplied with the mass of crude material they now have, and "cramming" will be unnecessary.

I had two preceptors, who were, as nearly as I can learn, quite as faithful as the average, and yet I was not *taught* by them,—only permitted (for a consideration) to pick up what little knowledge and experience I might while rendering the largest possible assistance in the laboratory.

I am unaware of any case in which a pupil of dentistry has been really taught, with patient labor and conscientious painstaking, such as a genuine pupil has a *right* to expect and exact.

Let judgment commence where it should,—with ourselves.

Now, as to our schools, is it any wonder that, with the unprepared material with which we supply them, and the indifferent, unsympathetic and yet hypercritical behavior on our part, they come so far short as they do?

I fear it has not often enough occurred to us that the schools are ours,—not ours to criticise merely, but to encourage with kind words, good suggestions, and the needed funds to enable them to act on those suggestions.

I have little sympathy with the cold and selfish man, who takes a moment from his money-getting only to sit in judgment on the efforts of men who rack their brains and drain their purses year after year to find at last their motives misconstrued, their results belittled, and themselves impoverished.

Rather let *us* hold up their hands,—that is nobler and better. He who earns the title of friend and patron of the schools has the right to friendly criticism or suggestion, but no such right belongs to him who is in no sense a stockholder.

We have many difficulties yet to overcome before we take the exalted position toward which we are steadily and rapidly advancing. Notwithstanding ours is a new country, we have driven away the savage beasts and more savage men, have hewn down the forests from Maine

to Oregon, made the desert to blossom as the rose, and found time to commence a higher culture, even outstripping our Old-World mother in the matter of dental education.

If this is true of the advancement of our country and our profession, what may we not expect of the next century upon which we are so soon to enter? With our increased educational facilities and the universal diffusion of knowledge, we are to rise far above our present status; but to attain this much-desired end, we must do all we can to help and nothing to hinder. Each can and should do something.

Let us commence anew and consecrate our lives and their results to noble purposes, living not for ourselves alone, but for mankind. To this end, I ask you to consider the following suggestion on which I have acted, and which I commend to all my hearers.

My plan is this: Execute a will, giving all your estate in trust to executors, with instruction to invest in New York State or United States bonds, or loaned on first mortgages on real estate worth at least twice as much as the loan. The interest only to be used in support of wife and children, at whose demise the trusteeship shall be transferred to the faculty and board of directors of ——— Dental College to continue invested, the interest only being used for sustaining a professorship, the purchase of apparatus, or such other objects as the testator shall desire.

To provide for the possible discontinuance of the school named, it is wise to nominate two or three others, who shall take precedence in the order named, and to whom all the conditions shall apply.

So far from working hardship against our dear ones, this method promises a sure support,—one which cannot be lost in speculation or jeopardized by the chances of legitimate business.

It seems only just that the man whose self-sacrifice has accumulated a fund, however small, should control that fund for the greatest good to the greatest number to the end of time if he can.

This ennobles the getting and the getter, making the testator feel that he is living and striving for a noble purpose.

Discussion.

Dr. W. H. Atkinson. I am sorry that there is not some spirit manifested to speak to a subject of such vital importance to us as a distinct body. All organizations grow out of the perceived necessities of men. I think a good many necessities are not perceived, and it is only upon the awakening of our perceptions that we are led to take steps to meet them by means of organizations. I do not know that I have a single word to say that ought not to be a word of commendation of the entire paper just read. There is evidence in it that the earnest man, to fill the store-house of his mind with useful lore, gives more attention to

that than to the measurement of his powers, and keeps his mind in a condition of humility, and, although he may oftentimes pronounce extraordinary truths, yet, for want of a closer and more accurate comparison with the character and labors of others, is apt to lack width,—and that is very generally predominant. I would rather have an ignorant man who always thought he was right, with his mouth open, than the wisest man with his mouth shut. I would rather a man would say falsely many things, and expose them in the hope that other men would set them right, than that wise men would never say anything.

It is very difficult for us to say what is the best thing to further the interests of our profession. Our profession is not a distinct interest outside of the general interests of humanity. We are a part of the race, and we are trying to fulfill the functions that have devolved upon us for want of obedience to law.

As to our country being in the advance in the practice of dentistry, it is not true that we are in advance in scientific attainments; but, so far as association is concerned, we are in advance of other countries. I have seen a letter from Paris stating that there is no local association in that city among the dentists, and saying that they work apart and separate from each other, seeming to fear lest one shall see the other's method and thus expose their ignorance.

I have never seen an earnest man, either in or out of the schools, who was not in favor of helping the school and the pupil. Men who never have sent a pupil to school will growl and find fault, and men who know nothing outside of the laboratory are the very men who find fault with the attainments of pupils and the efficiency of the colleges. The colleges have indeed graduated men whom they ought not to have graduated. But I would rather they would graduate ten times as many as they do, and of no better class, than to go back where we were before we had colleges. I think I am entitled to say something from personal knowledge about this thing, and I think my own heart has been wrung as much as any man's in the entire profession in respect to the necessities of the profession and the faults of much of its material. It has been the heart and soul burden of my life to see if we could not get teachers and colleges equal to the demands and circumstances of the times, who would come up to the administration of the truth with power and resources equal to the task. We need colleges which are able to endure the tests of the highest standards of excellence; we want men of power and intelligence, who can help young men, and not throw difficulties in their way; and we want young men in the profession gifted with intelligence, keen observation, and earnestness, who will be satisfied with nothing short of the best knowledge which the profession can afford them. But let us be glad of the good work the colleges are doing; measure it by true tests, and encourage them in all that is good.

I cannot tell you how happy I would have been to have heard when a young man what I have heard here to-night. I think I would not have been able to contain myself: I would have been wild with delight. Fifteen years ago I would not have thought it possible to have in one whole lifetime witnessed the progress that has since been made, and all I have to say is, go on in the same way.

In regard to the suggestions of the essayist of the evening, as to getting life insurance, having property willed for the good of the profession, etc., I think I see some difficulties in the way of carrying out such objects; but I observe that it is only those who are constantly conjuring up their fears who are in the slough. I do not think it is the greatest blessing to leave a large inheritance to children. I think many men have been ruined by this very thing, who, if they had had the stimulus of necessity behind them, would have been wonderfully successful. The necessity of work is often the greatest blessing to those who only need something to stimulate remarkable natural powers.

Dr. C. E. Francis. I listened to the paper of Dr. Latimer with great pleasure. There are so many points in it which call for special attention that it is really difficult to know which ones to speak to. He says many gentlemen go to a dental meeting as to a place of amusement, simply to be interested and amused, and advises that every one should come to our meetings prepared to present some item of interest to the profession. I have often thought that if every member of our society would from time to time, between the meetings, think of some incident of office practice,—of some particular case,—perhaps making a record of it, and state it before the meeting, it would be of great interest, and I only regret that I myself do not think of these things more than I do.

Dr. Latimer speaks of our dental schools as not being over and above efficient. He is certainly right there; but our dental schools are improving all the time. Students are not, as a rule, thoroughly educated as dentists when they leave them, although they have parchments in hand. Question them, and you will find them in the dark in regard to many things which they might be expected to know. Our dental schools, and the same may be said of other schools, are not particular enough in the choice of students. They will admit almost any one who applies. I think applicants for admission to a dental school ought to undergo a preliminary examination before being admitted, the requirements being a thorough academic education; and I think if the dental student could spend a year with some reputable practitioner before going to college, he would be in a far better condition to pursue his studies and understand the lectures. It should be considered the duty of every dentist who receives a student to require him to pursue a proper course of study, and not make a mere office-boy of him; and after he has been with him a certain length of time, then require the

student to attend some school—dental or medical. Even if our dental schools are not as perfect as they might be, a student may be much improved and profited by passing through one.

[Dr. E. A. Bogue having invited a patient to be present, and the gentleman having arrived, a recess was taken, in order that those present might inspect Dr. Bogue's operations.

These consisted of a bicuspid, built up on the buccal side entirely to its former shape, but in which the gold had been so intermingled or alternated with platinum as to present a gray color instead of the usual bright yellow of gold, a color much less noticeable in the mouth.

The other operation was the restoration to nearly its original contour of a large molar tooth, with a cavity extending from the gum on the proximate side to nearly the front of the grinding surface, and having both lateral walls broken away, so that the cavity was a widely open one, nearly without embracing walls.

This was done with Fletcher's amalgam, malleted with the electric mallet into a matrix made of hard rubber, which surrounded the broken tooth, giving it walls, and embracing the two adjoining teeth, front and rear, to steady it. The filling was inserted this same day at noon, and, after being examined by the gentlemen present, the matrix was removed, and the filling was found quite hard enough to eat upon with safety, or to bear burnishing.]

Dr. O. E. Hill. For the life of me I cannot see the necessity of that matrix nor the necessity of all that work. Perhaps I am wrong, but I think there has been too much labor and time spent on that amalgam filling. It seems to be the universal tendency to perform a great deal of work to accomplish small results, and call it science. In this case, could not the same results have been accomplished in about three minutes by putting a piece of wedge-wood in between the bicuspid and molar and filling in precisely the same way, or nearly so? That is how I should have done it. I criticise nothing except the amount of work done to accomplish that result. I think it is too much, just as I think it is too much to put the rubber dam on six or seven teeth to fill a simple approximal cavity, and be two hours doing it. The tendency seems to be that way; and while we are striving for a higher order of talent in our operators and manipulators, I think we should not forget that the simplest method is the cheapest, and the least expensive way of getting a good result is the one we should adopt.

Dr. E. A. Bogue. That is the kind of criticism we want, and if any gentleman brings here a piece of work, he does it expecting criticism that is to help him.

In answer to Dr. Hill's criticisms, which are perfectly legitimate, I would say that Dr. Jack, so far as I know, is the originator of that way of filling a tooth.

Dr. W. H. Atkinson. I do not understand it to be Dr. Jack's method at all.

Dr. E. A. Bogue. It is, so far as I know. The object of putting that matrix on is twofold: first, to obtain greater facility during the filling; the second is, greater perfection in the filling. Amalgam is *queer stuff*. I thought awhile ago I knew something about it; I have about made up my mind that I don't. An amalgam filling put in at a consistency such as we would ordinarily call plastic, is not, as a rule, a reliable filling in a wide, open cavity. This cavity, as Dr. Hill may have noticed, was as much like a saucer as it well could be. There were but two places where a hold could be got. It could not, as I see it, have been built up in its present shape or anything approximating it, without something to confine the amalgam. It would surely have broken off. As to the result, I know what it is from many experimental cases. That filling is perfect as nearly as we may predicate perfection on anything so uncertain as amalgam. It will not crack, and, unless the tooth breaks, it will not break. It is in every respect, save color, and I don't know but in that, just as good a filling as the one on the opposite side of the mouth. It took about an hour to put in this one; and the one on the opposite side of the mouth took five hours.

With regard to the manufacture of those matrices. Work of that kind can be done in the laboratory. It requires about one or two minutes to take the impression; it is then passed over to the workman, who brings the matrix back finished. My own hands were occupied about ten minutes with this one.

I will state another thing: That filling was put in by using Fletcher's moulding mortar, which is a piece of ivory about as big as a quarter of a dollar, with a hole in it perhaps three-sixteenths of an inch in diameter, and a plug just fitting the hole. The amalgam, which is so dry that you cannot make it cohere by taking it in the fingers, can be put into this mortar, pressed into little cakes, and then it can be cut up and used like sponge gold, or blocks, with a rough instrument (it may be a heated one), and put into its place. The surface will show the presence of mercury. It does not ooze out in drops; it does not become even as manifest as you would call sweating, but you can see it plainly by its glistening.

Dr. J. W. Clowes. If we are going to squeeze out all the mercury, we are getting rid of that which constitutes the toughness of the amalgam.

Dr. E. A. Bogue. I never squeeze out a particle of mercury.

Dr. J. W. Clowes. I understood you to say this amalgam was so dry that it would not hold together. As I understand it, a good amalgam must have plenty of mercury in it.

Another thing that I did not hear Dr. Bogue mention as using to retain fillings, viz. screws. I think a screw or two would have been just the thing in this case. They are an excellent help in building up a tooth with amalgam. I have used sometimes platina and sometimes iron ones. A piece of a hair-pin with a thread cut on it answers the purpose.

A curious thing happened in connection with the use of such screws: A patient for whom I had built a tooth upon an old root last November came to me the other day with the crown off of its root. I had put in two good screws, but the crown was off,—not broken off—but actually those iron screws were dissolved away. The part that went up in the root was in a liquid, inky state, and the portion that remained in the amalgam was not disturbed at all.

Dr. W. H. Atkinson. The trouble was, they were not perfectly free from moisture.

Dr. E. A. Bogue. While having this subject under advisement, I will mention one thing which we ought to bear in mind. We need some filling (and so far as we have reached yet, amalgam is the best one we know of) to take the place of the forceps. We don't want amalgam to put in the bulk of our cavities; we don't want to encourage the use of amalgam; but we do want to discourage the use of the forceps, and an amalgam filling in a mere shell of a tooth is a deal better than a vacancy.

When an amalgam filling is put into a large open cavity of a molar, for instance, the gentlemen present may not have carefully considered the fact that the circumference of that filling sometimes equals or exceeds an inch. In putting a large amalgam filling into a cavity of this kind, we put in a great bulk and an extent of superficies, which must, if the material contracts at all, show itself very markedly. If that same material were put, as I have seen with great admiration, in pin-head cavities in central incisors, by Dr. Clowes, the amount of contraction in a cavity which was not more than one-eighth of an inch in its longest diameter, is infinitesimal, as compared with the amount of contraction of the same amalgam put into the molar cavity whose circumference extends over an inch.

Then again, when a large amount of mercury is put into a filling, whether it is designed to make it "tough and strong" or not, it will invariably give a condition of things that amounts to filling with a fluid or semi-fluid, or soft plastic substance; and during the time of setting centripetal force is in operation, and the tendency to ball up is constantly at work; and if that force is not counteracted by another force from the outside, the filling is drawn away from the margins of the cavity. We need, therefore, to get our filling into the tooth dry and hard, either in the ordinary way, or by the aid of a wood, steel, or rub-

ber matrix, or a quill, that we may pack it where we want it and keep it there, and have it set, before it has an opportunity to tend much towards a sphere, or draw up and away from the edges.

Dr. O. E. Hill. Then in putting this in so dry, you propose to amalgamate the metals in the tooth instead of out of it?

Dr. E. A. Bogue. Partially so; yes, sir.

Dr. Wm. Jarvie, Jr. Does Dr. Bogue want to go upon the record as stating that mercury is one of the toughest of metals?

Dr. E. A. Bogue. Certainly not. I do not regard the presence of mercury as increasing the strength of fillings so far as I have gone.

Dr. O. E. Hill. You recognize the necessity of mercury in the filling?

Dr. E. A. Bogue. Certainly. But the amount of mercury that is necessary to make a strong filling is surprisingly small.

Adjourned.

AMERICAN DENTAL ASSOCIATION.

(Continued from page 484.)

FIRST DAY—*Afternoon Session.*

THE report on "Physiology," by Prof. McQuillen, was taken up and opened for discussion.

Dr. Shepard spoke of a marked case of variation in the time of eruption of the deciduous teeth in the same family; one boy had erupted a tooth at four months of age, and at eight months had eight teeth, while another had no teeth till eight months old, and at one year had but five teeth.

Dr. Peirce. It is a question whether this is a difference of development or only of the removal of the gums from the surface of the tooth. He had seen two teeth at birth, but they were no further developed than others, only they were prematurely through the gum. As to the alleged difference of eruption in different countries, he had heard it explained on the ground that children were put to work in factories in England at an early age, and, to prevent the children from going to work so early, they call the sixth-year molars seventh-year teeth. He believed that the law there was that children should not go to work till those teeth were cut.

Dr. Atkinson. There is one point that it is important for the dentist to know, and that is in regard to the relation of the shedding of the temporary teeth to longevity. Twelve times the period of the life of these teeth is the normal limit of life of the individual. A premature development indicates a short-lived existence,—*"Soon ripe, soon rotten."* The cetacea have all their temporary teeth before birth. In these cases

of premature eruption it is probable that the gum has lost its capability of appropriating corpuscles; the tissues having fulfilled their mission have been removed, and the tooth has become uncovered. He has yet to see any root of a temporary tooth absorbed that has not a carneous body against it; a carneous body is a congeries of great cells; whether it is normal or abnormal depends on when they are, and where they are. They are almost always present when bone is absorbed, but he is not prepared to say that they are the cause of absorption, nor that the cause of absorption is not an acid. We jump at conclusions, and assume too much. We can produce absorption by simple pressure; we do not understand the chemistry of physiology; the secretions and excretions do not exude between the cells, but percolate the cells themselves. It is pabulum on one side, and saliva or other secretion on the other; the change takes place during the passage, but what it is remains for us to prove.

Dr. Francis (New York). We cannot assert positively that absorption is caused by pressure, but we observe that when a tooth impinges upon a root, we find portions of the root absorbed. The temporary tooth sometimes remains firm, and the permanent one takes its place by its side, and there is no absorption of the root. It seems that the presence of the temporary tooth has something to do with it.

Dr. Atkinson. The temporary tooth is never absorbed at the apex; the pulp is destroyed, and the point of the root is chemically removed.

Dr. Morgan. Absorption is a chemical action, and that is as impossible in a dead tooth as in a dead man. Pressure is necessary to absorption of the root. The difference of eruption noted in different countries is worthy of note. It may be due to climate. There is a more rapid development as we approach the equator. He has seen twenty-eight permanent teeth at eight years of age.

Dr. Abbott said he had seen a case of the eruption of twenty-eight permanent teeth at eight years. He thought that absorption, instead of being due to pressure, was the result of a physiological irritation sufficient to cause a taking up of material; he did not believe that the material so taken up was reassimilated; he had never seen pressure on the end of the root sufficient to destroy the pulp.

Dr. Kingsbury. Absorption never takes place after devitalization, although some may think it does; the presence of a carneous tissue is necessary. The existence of the permanent tooth does bear an important relation to the process, as is proved by the fact that when the germs of the permanent teeth are wanting the temporary ones remain. We sometimes find partial absorption without eruption of the permanent teeth, but that is the exception; absorption is a vital process.

Dr. Flagg said he supposed that was settled twenty-five years ago. The carneous body is concomitant with absorption; it tends to permit

it. Absorption changes into disintegration after devitalization; a breaking-down is not absorption. Roots disintegrate very little after devitalization; they are shot out, driven out by pressure, and there is no carneous body there; it is a sort of exfoliation, not exactly like that of bone, but like that action which pushes an artificial set out of its place when a wisdom-tooth erupts under it. There is sometimes a non-absorption of the roots of the temporary cuspids, and a serious mistake is not infrequently made in extracting them, the permanent failing to appear. The temporary cuspids should always be maintained till they are loose; if extracted when swelling of the gums takes place it may be five, ten, or fifteen years before the permanent teeth make their appearance. He cannot see that there is such a difference in the eruption of the teeth in different countries; in this country, from five to seven years is the usual time of eruption for the sixth-year molars, and that is the time given for England. There is a difference as to development in different nationalities. In this country we live fast and are precocious, and have to cut our eye-teeth early. Questions of this kind are so illy and abominably laid down in these old books that the subject ought to be worked up. Even our latest works advise the extraction of the laterals to make room for the coming cuspids. We want no more works of that kind, though some of our journals say we do.

Dr. Butler, of Cleveland, thought the roots of permanent teeth are sometimes absorbed; he had seen two cases of the kind within a few months.

Dr. McQuillen explained that he did not say that the carneous body did not absorb the roots of temporary teeth; he said he had reason to believe the action to be one of retrograde metamorphosis. He had been too long engaged in physiological investigations to make dogmatic assertions.

The subject was then passed.

Dr. Buckingham, upon leave, introduced a resolution providing for the appointment of a committee to prepare suitable resolutions in regard to the death of Prof. Wildman. Profs. Buckingham, Taft, and Chandler were appointed such committee, and subsequently reported the following resolutions, which were unanimously adopted:

Whereas, In the midst of life we are in death, yet in our profound sorrow we bow in meek submission to the mysterious dispensation of Him who doeth all things well; and,

Whereas, In the sudden and unexpected death of that esteemed and valued member of our profession, Dr. Elias Wildman, we have lost a most valuable member,—one by whose untiring labor for the last forty years the profession has been incalculably benefited,—who, as an investigator and teacher, stood in the very front ranks, and whose discoveries and contributions will endure as long as the profession exists; therefore be it

Resolved, That we mourn the loss of our departed brother, the evi-

dence of whose labor and ability and good works were seen every day; that as his professional career was one of constant labor for our benefit, so his private life was pure and unspotted, exhibiting a rare combination of those virtues which constitute the true man and good citizen; that although the place which has known him shall know him no more, yet his name shall not be lost, for it is imperishably written in his works.

Resolved, That we tender to the family and friends the condolence and sympathy of this association, and that these resolutions be entered upon the minutes, and upon a memorial page in the Transactions.

The subject of Pathology and Surgery was then taken up, and the report of the committee called for.

Prof. Flagg, chairman, read a brief paper, hardly to be characterized as a report, as it was merely suggestive. It stated that fourteen years ago the question had been pertinently asked, "What have we worthy to be called Dental Pathology?" and still the query seems unanswered. So much discrepancy exists, such diverse views are entertained, such differences of results reported, that the best men are arrayed as foes, and lesser lights must grope in darkness. This ought not to be,—for what is truth is truth, and what is false is false. In our journals we find consecutive articles, each bearing signatures we would delight to honor, each giving evidence of thought, earnestness, and experience, yet each advocating views condemned by others, and denouncing practices extolled by some. Some action should be promptly taken which should stop this waste of energy. These workers still should work, but some means should be devised by which the danger of losing sight of truth in sight of self should be overcome; by which such solid rules might be deduced as would result in individual benefit.

The paper then suggested, as such means, that a well-organized "Section of Pathology" should be instituted, which should be endowed with that vitality which springs from permanency. From this action it was hoped that such result might accrue as would tend to elevate our calling in the scale of suffering humanity, by which the amount of pain which we can now relieve may be rendered vastly greater, and by which our pathological differences might be reconciled.

The report was accepted, and that portion of it recommending the establishment of a "Pathological Section" was referred to a committee, to consider the advisability of such action. The committee, consisting of Drs. Hunt, Atkinson, and Morgan, subsequently reported that they were unanimously in favor of such action, but that there was not time to properly consider the subject at this session, and they therefore asked that they should be continued, and allowed to report at the next meeting.

This report was received and adopted, and the committee continued. After some miscellaneous business the meeting adjourned.

Evening Session.

Dr. W. N. Morrison read a short paper upon Dental Pathology. The paper referred to the report, published in a recent number of the DENTAL COSMOS, of an operation for the removal of a section of the inferior dental nerve, by Dr. Garretson, and proceeded to give some of the author's experience in similar operations. Being called upon for a loan of instruments by a surgeon of St. Louis, to enable him to perform such an operation, the writer suggested that the old operation was unnecessarily formidable, and that with the dental engine it could be done much better, and leave no wound. Drills were made for the purpose—one a flat and the other a bur-drill—that would drill holes about one-fourth of an inch in diameter. The patient was a lady about seventy years of age, who had suffered with intense neuralgic pains for twelve years. A hole was drilled corresponding to where the third molar stood, and carried downward and outward till the inferior dental nerve-canal was reached, when it was enlarged by the bur, and as much of the nerve destroyed as could be by moving the bur back and forth in the canal fully half an inch. In cases where it is desirable to remove more than this, it might easily be done by drilling another hole at the proper distance forward, and removing the section of intervening nerve with a hook shaped instrument. This operation can thus be performed through an opening not larger than that resulting from the extraction of a bicuspid. In this case complete relief was afforded, as well as in a number of similar ones. The dentist is rarely called upon to treat such cases, though he is better qualified than the surgeon to perform this operation.

Dr. Shepard spoke of a multiple knife used by Dr. Goodwillie for performing surgical operations, actuated by a powerful driving-wheel. By its use almost the whole of a necrosed vomer had been removed with scarcely any external wound. He thought there was a great field for improved operations in this direction; the engine ought to do away with the gouge and chisel. An osseous tumor could thus be removed with but very little external cutting.

Dr. Mills said that he had had trephines made to work in the engine, and had used them repeatedly.

Dr. Barker said he could not see the advantage in this use of instruments. A large amount of comminuted material must of necessity be left in the cavity, which would create irritation and do mischief. A trephine might be successfully used, but for deep-seated cutting he could not see the advantage.

Dr. Flagg thought it hardly right for the last speaker to make such objections when he had not seen the instruments. He had been experimenting with revolving knives, having seven blades, and revolving two thousand times a minute, by which means he could excavate sensitive

dentine and lance abscesses with very little pain. A heavy driving-wheel is necessary, and he drives his with a Sims electro-motor.

Dr. John Allen mentioned the case of a gentleman, aged forty-five, who suffered from long-continued neuralgia, the optic nerves being affected so that he lost his sight. No oculist could discover anything wrong. The wisdom-tooth was erupting, and he had advised extraction, which was accomplished. The jaws had been set for six weeks, but this gradually improved, as also did his sight, and to-day he can read. The whole trouble arose from the wisdom-tooth.

Dr. Rehwinkel said he had used a trephine as a last resort in alveolar abscess in single-rooted teeth, and the operation had been in every case very successful. He could never approve of crushing the alveolus by the forceps. He thought the engine would become very useful to the general surgeon.

Dr. I. Knapp spoke of a case of apparent connection between an inflamed eye and a superior molar. The sight was lost. He had slit up the gum and endeavored to remove the tartar, and in doing so had apparently touched a live nerve. The tartar had reached the foramen and impinged upon the nerve. The tooth was extracted and the eye got well.

Prof. Abbott stated a case of severe abscess from the lateral incisor, canine, and bicuspid. Pieces of bone were found detached from the alveolus, and also in right nostril, apparently the inferior turbinated bone. These were crushed and picked out, and the case treated with a weak solution of aromatic sulphuric acid and carbolic acid and water. The teeth had become firm.

Prof. Stellwagen spoke of a case of an alveolar abscess at the root of a tooth of a horse, which opened on the nose, between the eye and the nostril; the pus must have worked its way up through the bony tissue three or four inches. He had extracted a portion of the tooth. He then spoke of atmospheric conditions as bearing upon the diseases of the teeth. He had had severe cases of neuralgia, etc., following capping of pulps and other operations, when these conditions were unfavorable. At the Pennsylvania Hospital it was found that a want of success after operations was more frequent on a falling barometer than otherwise. A northeast wind and low barometer were not favorable to certain dental operations.

Dr. Bogue said he had noticed more cases of abscess during the extreme warm weather.

Dr. Stellwagen had noticed the same.

Dr. Morgan said that in his region one-third of the population (the negroes) pay no attention to the teeth, and have very bad teeth. June was the worst month for toothache, and a change of weather would sometimes double or quadruple the cases. Warm weather with low

barometer was most debilitating, and dyspepsia and rheumatism were always worse then.

Dr. Barker thought we were apt to take superficial views of things. A change of habits was often the cause of trouble. City people go to the country and do as country people never do,—they sit out of doors at night, etc., and the consequences would fall upon any part which was in a pathological condition.

Dr. Harlan, of Chicago, said he had noticed the frequency of abscesses, etc., during heated terms, and that people indiscriminately were subject to it. June furnished more cases of toothache than three or four other months.

Dr. Flagg said that he had tables extending over fifteen years of time. March has three times, and November twice as much toothache as other months. In March they came into the hundreds. He was glad to say that the teeth filled in the canals with cotton stood the test nobly at such times. Patients who die of consumption and typhoid fever have trouble with their teeth. These organs and the hair show the state of the system before the patient is brought to his death-bed. Medicines do not decay the teeth. Alcohol should be kept on the outside.

Dr. Rebwinkle, of Chillicothe, Ohio, said that we scarcely ever hear the surrounding circumstances mentioned; the individual skill of the operator only is taken into the account. Eminent men differed as to root-filling, and it depends less upon what a tooth is filled with than upon the surrounding circumstances. There are localities where pulps cannot be removed and the canals filled at once with success. Where he lives, there are difficulties all the time, but toothache appears to be epidemic at times. Climate, constitution, and temperament must be taken into account, and the cases selected.

Dr. Barker said that it is the most highly organized tissue that first responds to overwork,—that is, the brain. We *can* give medicine that will produce decay. Why do we have decay following typhoid? It is a result of mal-nutrition. He takes issue with the idea that there is no medicinal use for alcohol; he knows his own life was saved by it.

Dr. Taft. If these things are so, the range of education ought to be wider than it has been. All these assertions about atmospheric changes, etc., are no doubt true. As the weight of the air changes, the pressure upon the body changes; inhalation is differently performed. More effort is required in breathing a light atmosphere; moisture has something to do with it. Why and how do these things occur, and what is the remedy? When the atmosphere is moist, the action of the lungs is impeded, and the *débris* is not eliminated from the surface, which becomes clogged. The electrical condition has a marked influence. A sudden storm had killed fish in an aquarium in his office. This subject

has been overlooked by medical men, and is only just beginning to receive attention. We should study it in all its phases, and compare notes. We should instruct our patients in these matters.

Dr. Bogue said that it had been published as fact, that when physicians who opposed the use of alcohol had had charge of the Massachusetts General Hospital, the death-rate had diminished. He asked Dr. Shepard as to the truth of this statement.

Dr. Shepard replied that he did not know.

Dr. McQuillen spoke of the importance of drainage, of which he had had personal experience. He believed the testimony to be in favor of the medical usefulness of alcohol.

Adjourned.

(To be continued.)

AMERICAN DENTAL CONVENTION.—TWENTY-SECOND ANNUAL MEETING.

FIRST DAY—*Morning Session.*

THE twenty-second session of the American Dental Convention convened at the Trinity Methodist Episcopal Church, Philadelphia, on Tuesday, August 8th, 1876. The meeting was called to order by the president, Professor B. F. Coy, of Baltimore, and was opened with prayer by Rev. Mr. Neely.

Professor Buckingham, of Philadelphia, then delivered an address upon the history of the origin of the convention. He alluded to the previously existing American Dental Society, as being too exclusive, and making the fatal mistake of attempting to criticise and govern the actions of others. A call for a meeting to organize a society upon a more liberal plan was signed by Dr. E. Townsend and others. It has been objected to this convention that it admits all who choose to apply. This is not strictly the case. A person may be excluded by objections. It is a success because it continues to exist, and its meetings are as large as such meetings usually are. Have there ever been enough quacks in the body to even give an odor to its proceedings? Such men do not attend meetings. The character of those who have attended and the papers read have been equal to those in any other body. There might, perhaps, be improvements in the organization. The American Dental Association is open to the criticism of being too exclusive. It refused, at its late meeting, to hear a gentleman who was elected as a delegate, because he was not a practicing dentist. Its membership, at the most, only represents one thousand dentists, leaving eleven thousand in the United States not represented.

Professor Coy then delivered the president's address, in which he

sketched the rise, progress, and development of the dental profession; congratulated the convention on its continued existence and prosperity; expressed the hope that it would discard dogmatism, and treat all subjects with liberal, decorous, and kindly feeling. He urged the necessity of a more thorough and careful education, saying that some of the dental colleges had shown a disposition to raise the standard of graduation, while others appear only to strive to increase the number of their matriculants, without sufficient regard to their qualifications. In closing, he called attention to the effort being made by the Dental Society of Maryland and the District of Columbia to induce the United States Government, through the medical departments of the army and navy, to aid in collecting statistics bearing on the decay of human teeth, and asked the assistance of the convention in the cause. A circular had been sent out by the society above referred to, in which it was stated that it was evident to thinking minds that the dental profession was working at the wrong end of the evil; that the simple operation of filling cannot save a tooth inherently weak in structure, nor can local treatment restore to health soft tissues whose pathological condition is the result of systemic derangement. The first step in the duty of probing this matter to the bottom, with a view to improving the teeth of our descendants, is to ascertain the causes that produce deterioration, and then to establish hygienic rules that will avoid those causes. As a foundation, it is proposed to collect statistical facts with reference to the condition of the teeth, in connection with the food-stuffs and habits of living of all classes of people in all parts of the world, civilized, partly civilized, or savage. In this effort we have the assurance of the surgeons-general of the United States army and navy that they will give us all the aid in their power in collecting statistics from nations and people which otherwise would be inaccessible to us as a profession. Wherever dentistry is practiced, these statistics can be obtained if the members of the profession will interest themselves in their collection. Individuals, and organizations existing or to be formed, are asked to assist in this work, and to apply for tabulated forms prepared for the purpose (which will be furnished by Dr. R. F. Hunt, Washington, D. C.), by which means it is hoped that a satisfactory solution of the difficulties of our profession would be reached.

Dr. A. Lawrence, of Boston, then read a paper upon the subject of anæsthesia. The paper, after enumerating some of the inventions and discoveries of the past century, which place America in the front rank in this centennial year, mentioned anæsthetics as by no means the least of blessings, and proceeded to give a *résumé* of the history of this class of agents, beginning with medicated vapors used by Galen, and by Piso and others, in the sixteenth and seventeenth centuries. The discovery of ether and chloroform gave a new impulse to this branch of healing.

These and some other substances can destroy the power of the nervous system to communicate sensation. The agents used possess similar properties, differing only in degree and rapidity of effects. Sulphuric ether acts most slowly of any of the three agents generally employed, chloroform next, and nitrous oxide most rapidly. Anæsthesia seems to be at a maximum when the hydro-carbon base is combined with nitrogen, and at a minimum when combined with oxygen. In considering how anæsthetics act, it is necessary to remember the anatomy of the air-cells, and the fine expansions of the pneumogastric nerves, by which the influence may be conveyed to the nerve-centers. It may also be indirectly transmitted to the heart through the blood. The cerebro-spinal system is first affected, then the reflex, and lastly, the ganglionic. If the dose is increased, the power of motion is lost, and volition and consciousness begin to be affected. Then the excitor nerves are engaged, the irritability of the eyelids, fauces, and glottis disappears, and a form of asphyxia ensues, indicated by stertor, which is a beacon to indicate danger,—the respiratory tract being then affected, after which death ensues. There is a relation between anæsthesia and the evolution of carbonic acid from the lungs, the quantity being less under the influence of anæsthetics.

The paper then called attention to a resolution adopted by the Massachusetts State Dental Society in 1875, and the report of the Committee of the Society for Medical Improvement in 1868, on the subject, the former of which condemned the use of chloroform, and considered its use by a member fit cause for censure; while the latter, in reporting on forty-one fatal cases investigated by them, declared that in not one of the whole number was the fatal result fairly ascribable to ether. The number of deaths by chloroform up to that time amounted to seven hundred. In the selection of the agent employed we should be guided by enlightened discretion.

The paper being declared open for discussion, Dr. Walker, of New Orleans, stated that the Southern Dental Association at Memphis had adopted a resolution condemning the use of nitrous oxide with but two dissenting votes.

Dr. Freeman, of Memphis, said that that meeting was but thinly attended, and not a representative one.

Dr. Butler, of Cleveland, said that he should object to the adoption by any society of which he was a member of such a resolution as that mentioned in the paper. To recognize anæsthetics as a boon, and then condemn their use! He would simply say that chloroform is one of the best-known anæsthetics, and cannot be dispensed with. He does not think it justifiable, however, to use an anæsthetic for the extraction of a single tooth, under ordinary circumstances. It should be used only when necessary, and it is not necessary because demanded.

Dr. Wetherbee, of Boston, said that the Massachusetts resolutions were adopted under circumstances of horror, resulting from a death in a dentist's office a short time previous. They were, in his opinion, uncalled for; but a powerful safeguard was desired. With some patients ether will not work kindly. In other cases, patients fail to inspire a sufficient volume of ether to produce the effect, and then a little chloroform will bridge over the gap. The system is prepared by the ether, and a small amount of chloroform is not injurious. It is only those who have not sufficient courage to undergo the operation without, who ought to have the use of these agents. In seven cases out of ten a patient may be persuaded to dispense with it.

Dr. Buckingham. How shall we find out how these substances act, and how shall we guard against accidents? One person claims to have used anæsthetics sixty-three thousand times, but he cannot tell how they act. He takes the cases indiscriminately, and has had no deaths. To what class, if any, ought we to refuse to administer them? Are there peculiarities in which they should not be given? Should examination be made of the lungs and heart? Are we justified in using anæsthetics for extracting teeth? Are we justified in sending patients to those who perform butchering operations? Do these substances act by affecting the nerves or a class of nerves, or by cell-action? We are ignorant in these matters. There is a risk in administering gas. Dentists know as much about these agents as the surgeons. When a fatal case or a case of malpractice occurs, the physician will cover it up; the doctor is always exonerated. The sooner we inform the public in regard to the danger of these agents the sooner we shall accomplish our end.

Dr. Wetherbee. In the case in Boston, which has been alluded to, the verdict was that the patient died from insufficiency of air; all but one of the jury were medical men, and the operator was perfectly exonerated from all blame. No one could tell why the patient died. We cannot tell why there is danger in these substances; but if we don't meddle with them we will not be harmed by them. It is dangerous ground.

Dr. Taft thought the reference which had been made to butchering operations was a slander upon the butchers. Laceration is very common with men who make a business of this thing. Exceedingly rapid manipulation is required. A butcher takes a sharp knife and makes a clean cut, but these worse than butchers bruise and tear, and make wounds which are a long time in healing. Anæsthetics should be condemned, even if there had never been a death from them; they are an encouragement to patients to have teeth removed that ought not to be. Patients value their teeth little enough, any way; many of them are ready to suggest extraction. There are pecks and bushels removed, the larger portion of which might have been saved. Anæsthetics in-

crease the number, and that should condemn them. He has never used them to any extent, and never expects to, and has not found a case where it was necessary. Has seen patients die under the hands of the best surgeons. Some have been injured for months, and perhaps never will recover; others, perhaps, are in insane asylums. Accidents are constantly occurring. Patients lose their voice, and lie in bed for weeks. The profession should discountenance the general use of these substances.

Dr. Bonwill, being called upon by Dr. Atkinson, gave some account of his experiments to prove that air itself is an anæsthetic, which he had already announced in the *Pennsylvania Journal*. Since that article was published (in February last) the method has been employed by medical men; he would simply reiterate that it gives evidence of perfect success in dentistry and minor surgery. If a patient is made to inhale rapidly before taking ether, the quantity required is two-thirds less. He had employed this inhalation in his own practice since last November, to the exclusion of chloroform, and had extracted two or three teeth at a time.

Prof. Coy said that he had had thirty years' experience in these things. He had used sulphuric ether cautiously, but had never combined chloroform and ether. He uses condensed gas, but does not produce deep anæsthesia. It should not be given after a hearty meal. He wants the lungs to get accustomed to inhaling before he proceeds. He gives it indiscriminately, even when there is palpitation of the heart. While the patient is coming out, leave the room and don't say a word, and the patient will have no bad memories.

Dr. Reynolds, of New York, agrees with Dr. Taft that it is an inducement to patients to have teeth out. Has also seen dangerous laceration; but that is no fault of the gas.

Dr. McDonnell, of Pennsylvania, adds his voice against the general administration of anæsthetics for extracting. He had used all three of the principal ones for twenty years, and his experience has been on the side of deprecating their general use. There is not one case in fifty that warrants it. It induces too rapid operating and too nervous movements. All anæsthetics are injurious, whether fatal or not. Some claim to be able to select cases, but he don't think they can. He had known the same gas to affect different persons very differently. In one case that he knew of, an idiotic roll of the eyes had stuck to the patient for years after taking gas. We cannot know all about anæsthetics, and only a fatal case would bring certain men to their senses. Men of experience lose patients; he had known a surgeon who had given hogs-heads of chloroform in the army, but had lost a patient in extracting teeth. Celebrated surgeons, as a rule, use ether; if they get a fractious patient, they put on a little chloroform, and then return to ether. He

thinks that nitrous oxide has done ten times the harm that it has good. If it had not been discovered, many would now have been enjoying their own teeth who have lost them.

Adjourned.

Evening Session.

The subject of Anæsthesia was still under consideration.

Prof. Winder said that, upon the principle advanced by some of the speakers, the most useful things might be condemned; foods and drinks may be abused by gluttons. He is wary in the use of anæsthetics, but many of his patients will not submit to operations without them. He does not wish to send them away, and have them fall into the hands of quacks; and to prevent this, is obliged to make use of these agents. He disagreed with Dr. Wetherbee in the opinion that only cowards demanded anæsthetics. He had a patient who could face the cannon's mouth, yet could not have a tooth extracted without them.

Dr. Wetherbee said that gentlemen do not all take the same view of cowardice; he had known a brave naval officer who could not bear to have a tooth filled; but it is a want of courage. He usually succeeds in inducing patients to forego the use of anæsthetics.

Dr. Walker, of New Orleans, said that he felt very much as Dr. Taft did; but there are cases where it is necessary to use these things. We should recognize the difference between the position of a patient on an operating-table and in a dental chair. The case cited by Dr. McDonnell was very likely the result of ignorance of this difference.

Dr. Mills, of Baltimore, spoke of a method of using chloroform mixed with perfume, and snuffed from a bottle. It produced a stimulating effect, and induced a feeling of composure in the patient, so that he had no hesitation about bearing pain. He had tried it, both in his own person and on nervous and excitable patients, with the best results. It seemed to give the patient confidence.

Dr. Townsend said that he had used chloroform in that manner very successfully.

The subject was then passed.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.—EIGHTH ANNUAL MEETING, JULY 26TH, 1876.

ABSTRACT OF PAPERS AND DISCUSSIONS.

FRACTURE OF SUPERIOR AND INFERIOR MAXILLÆ.

DR. J. S. KING, of Pittsburgh, read a paper upon this subject, describing a case which he had recently treated. The patient was a boy of twelve years, whose jaws had been crushed by the axle of a railroad car. The parts when first seen, some days after the accident, were in a high state

of inflammation, discharging upon the slightest pressure a large amount of watery pus from the mouth, nasal cavities, and eyes. The nasal bones appeared to be separated from the cranial bones and from each other, as well as from the ethmoid and maxillary bones. Both the superior maxillæ seemed to be separated from the other bones of the head, and were broken into three sections; the left one seeming to be attached to a portion of the orbital plate, the fracture extending backward so as to embrace the germ of the wisdom-tooth. Several small detached pieces of bone were removed during the preliminary examination. Each of the three portions sagged downward toward the inferior maxilla, apparently requiring to be raised nearly half an inch, in doing which profuse quantities of pus were discharged. The inferior maxilla was fractured at the symphysis. With great difficulty, and after several attempts, an impression of the upper teeth was obtained, with the teeth nearly in place. Of the lower teeth it was found impossible to obtain a correct impression; and the plan was adopted of cutting the plaster model in two at the point of fracture, and reuniting it correctly with fresh plaster, by which means a splint of black rubber was correctly made. Into these splints unannealed brass wires were imbedded, one end of each passing out between the lips, and having a stirrup or slot to which the necessary bandages were attached. By this means the teeth and splints were firmly held in position until the parts united. The use of the brass was not found to be in any manner objectionable. Although the bearing of the patient was for some time nearly destroyed, yet the case is now a perfect success, none of the teeth being displaced, or having apparently lost their vitality.

The paper was then opened for discussion.

Prof. Barker, of Philadelphia, said that at present the treatment of fracture of the inferior maxillary is much simplified by the introduction of plastic substances, so that any one of moderate ability can accomplish it. In treating the case, the character of the bone, the shape and size of the fractured part, and the direction of the force producing the lesion, should be considered. A blow upon the symphysis will produce fracture at the ramus. Dr. King failed to recognize the ease with which the articulation can be made, even when there are a great number of pieces, by simply placing the impressions upon an articulator, by which means a correct articulation may be obtained. For impressions there is nothing better than gutta-percha and wax made very soft. It is not necessary to have the impression as perfect as if for a set of teeth. All irritation should be avoided; there is no necessity for forcing the parts into position when you know that they will fall out of it again as soon as the impression is removed. It is only necessary to have the prints of the teeth of both the superior and inferior maxillaries. He did not recognize the necessity for the brass wires; all that is re-

quisite is a simple bandage. The splint and parts must be rendered permanent, and retained in apposition until union takes place. Black rubber may have advantages over red, but the cases are rare where the latter affects persons badly; he has only seen two or three. Celluloid makes very efficient splints. (Several of these were exhibited.)

Dr. J. S. King. In many cases getting the impression may be simple, but in this case it was otherwise. The complicated fracture and great displacement rendered it difficult. The wires came outside the face, and the attachments of adhesive straps and bandages were made to them, and passed over the head, which was shaved. A transverse bandage was also necessary, behind the head. The appendages to the inferior splint came around under the chin, and, when all was in position, the patient could open his mouth with ease. The wires were in this case of immense value, holding the parts firmly in position.

Dr. Barker said that he still could not see the advantage of this method, though he did not contend that it was not successful. It seemed to him that the apparatus described would produce pressure upon the fracture, so that the effusion of plasma would not only not be encouraged, but might cause absorption, and necrosis might ensue, which of course was the very thing that was to be avoided. Surgeons always arrange splints so that this pressure will be avoided as much as possible.

Dr. King asked how Dr. Barker would have controlled this case, and supported the bones that were dropping down.

Dr. Barker said he had seen but three or four cases of fracture of the superior maxilla; it is extremely rare, while fractures of the inferior maxilla are common; but he had never had any difficulty in holding the parts in position. In the superior maxilla we have to rely upon the inferior maxilla to hold it in position. The old plan of quantities of bandages has been simplified, and we now use as little bandage as possible. He does not like adhesive strips.

Dr. King thought Dr. Barker failed to understand the case, and that if he had seen it he would not have urged his objections so strongly against the appliance. There was no large amount of force applied, nor undue pressure upon the fracture, nor tight-drawing of bandages. The advantage of the brass arms was that the mouth could be opened and shut at will. He failed to see how it could have been treated without the arms. Their object was merely to steady the splints in their place, and at the same time allow the free use of the muscles.

Dr. Beck said that he had treated a fracture of the inferior maxillary at the symphysis by merely lacing the teeth together with a fine gold wire, without any splint or apparatus. He had also had a case, of a lad aged eight, in which a physician, in attempting to remove a deciduous molar with a turn-key, had fractured the process from the symphysis to the ramus,—a very bad fracture,—and before it was seen necrosis had

already taken place. The treatment consisted in a supply of rich food, mountain air, exercise, and the administration of phosphates, and in two months the piece was removed entire, including two permanent incisors, and all the bicuspsids and molars, with a portion of the ramus. The case healed without disfigurement.

Dr. A. J. Wade, of Iowa. The method of fastening by wires would answer in case of a single fracture, but where the bone is broken into three pieces the anterior fragment would be drawn down, and it would not work. He had treated a case of this class successfully, in which wires failed to hold the parts in position. Impressions were taken in three parts, and, by antagonizing them, a splint was made with arms, like the one described in the paper. An elastic bandage was used under the chin, to force the anterior fragment into position. Dr. Barker would probably agree that this would not exert too much force in this case.

Dr. Barker said that only a very simple apparatus is required. All we have to do is to study the law of force. We should be familiar with the anatomical structure, and overcome any force in the wrong direction by a sufficient amount exerted in the opposite direction.

Dr. Stellwagen spoke of a method of making a temporary splint, which consisted simply of using impression-cups with the handle removed, taking an impression in pink gutta-percha, and using the whole for a splint, cutting away in front if necessary, and wiring the upper and lower ones together.

CONSERVATISM IN DENTISTRY.

Dr. W. E. Magill read a paper upon the subject. After alluding to the circumstances of the Centennial year, the writer stated that he possessed a copy of the *Philadelphia Chronicle* for 1769, in which was found no notice of dentists or dental operations, save the advertisement of one, "Mr. Hamilton, Surgeon-Dentist and Operator for the Teeth, from London, who cleans and beautifies the teeth, and displaces all superfluous teeth and stumps, with the greatest ease and safety, and makes and sets artificial teeth, from one single tooth to a whole set, in so nice a manner that they cannot be distinguished from natural." The position occupied by the profession in Philadelphia to-day was contrasted with this advertisement; the fact was noted that from her dental colleges graduates go forth to all the States, to Europe, and the islands of the sea; this being but a sample of the progress made by our profession throughout the land. The cause for this development is education, a growing appreciation, both in and out of the profession, of its capacity for good, and the correctness of its principles. The operator of years gone by considered it to be his main business to extract and replace teeth; the result was that men skilled in jeweler's work

adopted dentistry in large numbers, without other preparation. This was a weight which dentistry has still to carry. Its relation to medicine and surgery was about the same as that occupied by the manufacturer of artificial limbs to-day. Let us give honor to the heroes who led the van and inaugurated a peaceful revolution in this respect! So long as dentistry was confined to these limits, it was but a gleaner in the fields of medicine and surgery; when it was discovered that teeth, when diseased, were the legitimate subjects of other treatment than the forceps, it at once took rank among the learned professions. Our declaration of independence dates from the day when we made known to the world that teeth rank in importance with eyes and ears, and that the man who was prepared to treat them is the peer of members of other professions, and entitled to recognition as such. Conservative—that is, *preservative*—dentistry has been progressive; from tin and amalgam it passed to the use of gold, and then to the treatment of pulps and abscesses. The loss of structure was restored by cohesive gold, in the use of which the laborious manipulations of hand-pressure gave place to the mallet. It is even proposed to substitute prevention for cure, and conservative dentistry now sits in profound meditation upon the question whether the time may not come when, by due attention to dietetics and physical development, carious teeth may be known only as exceptions.

The tendency of the party of progress has been toward radicalism. The extraction of all teeth which could not be filled with gold has been advocated. Cohesive gold has been used in large cavities and small, with and without anchorage, against walls both strong and frail; and young men have won their diplomas with no experience in filling teeth other than with this material. There has been a rush after oxychloride, creasote, carbolic acid; after gold, from No. 3 to No. 200; after mallets, of all materials and of all weights. But it is by such modes that the world is moved; the army of progress depends upon its advance corps of radicals. There are men so comfortable in their oyster-like existence that they seek no change in modes of practice, see no progress in anything that is new. Others there are who, though not opposing, are yet cautious; originating nothing, they are never leaders, but their good sense is the support of every reform. To them we are indebted for the continued use of gold plates and of soft foil. The advance-guard have occasionally taken ground which they could not hold, and have been obliged to fall back. Many, from using cohesive foil and the mallet exclusively, have modified their practice, using more and more soft foil, until they find it their main reliance in a large number of cavities. These quiet victories of conservatism are not so remarkable as those of more recent date. A prominent dentist of Boston recently advocated in the American Dental Association the use of less

expensive materials than gold, because the cost of the latter was a bar to the usefulness of our profession to a very large class of worthy people. Even now there is haste among wise men to be foremost in proving that poor old abused amalgam is the best filling in the world for teeth of a peculiar structure, the number of which is said to be increasing rapidly.

Discussion.

Dr. Kingsbury. The good sense of the paper must strike every one present. He, for one, had stood strongly against many of the innovations of the profession, and had laid himself liable to the criticism of being a little old-fogyish because he had not deemed it his duty to make such a universal use of the rubber dam as some do; because he did not clasp to his bosom the electric mallet, and use it to the exclusion of hand-work in every case; because he had not advocated cohesive foil to the exclusion of soft, and because he had not made use of motive-power for every operation. He had not been an indifferent observer by any means; whenever any improvement had been presented to the profession he had given it an impartial examination, and had appropriated what he regarded as really valuable. It is not long since cohesive gold was used almost exclusively, and even sponge and crystal gold once took the place of foil. He does not use these preparations to the extent some do; although they are easy of manipulation and the operations are beautiful, yet there are properties and want of properties in them that render them less valuable than other forms of gold. He had been mortified at the failures he had seen with these preparations, not only at his own hands, but at those of other excellent operators. He took a decidedly conservative ground, and so must every judicious dentist of experience, and guard conscientiously against radicalism.

Dr. McDonnell indorsed Dr. Magill's paper. He claimed to be a conservative man himself, though he had not always been. He thought the profession laid too much stress upon the effect of manipulative ability, or upon the material to be used, and lose sight of the fact that one material in a certain mouth and in a given tooth is very much better than another material would be in the same place. In the idea of manipulation we lose sight of the fact that there will be recurrence of decay, and that there is a want of cleanliness. If the profession is guilty of any one fault, it is the lack of advice to patients as to keeping the teeth on which they have spent so much time in a condition of cleanliness. The same cause that produced decay in the first place will do it again. His experience was that amalgam is a most excellent material in the proper place, and so is gold, and the great point in conservatism is to have the power to diagnose, when a case presents, as to what it is best to use. Many fine operators make mistakes by using the dam and filling with gold in difficult cases and for nervous patients.

It makes no difference how fine the operator or the operation, if a mistake is made in building up a tooth in posterior parts of the mouth and under difficult circumstances, while the patient has little nutrition, the patient may be demoralized so that he will never have a tooth filled again. We must always consider the pain to the patient and the cost to the pocket. Our finest operators are to-day making a serious blunder and demoralizing dental patients by inserting gold fillings in difficult situations, at a great cost of money and suffering to the patient, when an amalgam filling would have been infinitely more satisfactory to the patient and better for dentistry, for the patient would then live to come back to be operated upon.

Dr. Webb. There are undoubtedly dentists who can preserve natural teeth, even if they do not possess the ability to do what are considered the very best of operations; such, rather than extract valuable organs, should insert amalgam. It would in many cases be better to use tin-foil or one of the preparations of zinc; but in almost every instance it would be far better to perform a first-class operation and use gold. Nature is not conservative, and why should the dentist who possesses the power to carry out his operations upon the teeth until he has produced the natural contour,—why should he go half-way in rendering these organs beautiful, durable, and useful? If one does not possess the ability, of course he is compelled to adopt some other method; but that does not make the practice any more correct. When these operations are performed as they should be, it is no doubt the correct form. Failures are attributable, in almost every instance, to some imperfection in the performance of the operation; some point is overlooked by the operator, and then he states that decay around the filling or at the cervical wall has taken place. If the case be traced, it will be found that the filling was imperfect or the preparation of the cavity faulty. If the operations are perfect, this will not be the case; decay will not recur about the edges or at the cervical margins.

Dr. Kingsbury regretted that Dr. Webb had given such a definition of conservatism as he had; he, for one, could not accept it. He (Dr. Webb) defines it to be half-way practice, that is, indifferent and imperfect practice. Now, conservative dentistry is for dentistry what conservative surgery is for surgery. Conservative surgery looks to the preservation of the natural organs rather than to radical cures by amputations. Conservative dentistry means the preservation of the natural teeth. Gold should stand pre-eminently at the head of all materials for this purpose, and he uses it wherever it can be used, but when it cannot be, or where the circumstances do not warrant it, he uses other materials. Conservatism in dentistry does not preclude the highest possible operations in our profession.

Dr. Webb said that he held that any one deserving the title of dentist

should do all in his power and use every means to preserve the natural teeth. He understood conservative dentistry to mean, not careless operations, but a sort of half-way between the two points. If a restoration of contour is wrong, a permanent separation is right, and the point between the two would be called conservatism.

Dr. Difenderfer said that amalgam is better than gold in some mouths and in some places, especially in cavities far back in the mouth, which cannot in a majority of cases be as well filled with gold as with amalgam. We make a great mistake and allow our prejudices to carry us too far in this matter. He alluded to Mr. Fletcher's test of gold fillings in glass tubes, and said that he had made a test himself, which consisted in coating a cavity in a tooth with sulphate of iron in such a manner as to leave no trace or mark; the cavity was then filled with S. S. White's cohesive foil, No. 6; a solution of tannic acid was then made and kept at a temperature of 98°, and the filling inserted in it. If the filling leaked, the sulphate of iron would be converted into tannate of iron, and a trace of it would be seen at once. He thought Mr. Fletcher's experiments not proper tests, because the expansion of gold was more than that of glass, while the contraction would be the same, so that the ink would be enabled to penetrate. He took the heat of the hand into consideration, which he supposed was about 98°, and made up his mind that Fletcher was wrong. He was not successful with this No. 6 foil, and had to come down to No. 4; and if he had not made this second test he would have thought Fletcher was right. The only way to avoid trouble is for every one to learn what he can and be guided by his own experience.

Dr. Dixon, of Philadelphia, considered himself a conservative man, both as regards the use of gold and amalgam and also as regards contour work. He could not be persuaded to be without amalgam until something better is discovered, but does not agree that there are teeth strong enough to be filled with gold which may be better preserved with amalgam. In his experience of twenty-five or thirty years with amalgam, he had never seen such a tooth. He had seen teeth, however, that were too far gone to be filled with gold that had been saved by amalgam for ten or more years. He would banish amalgam from his office rather than have it go forth that he would use it where he could successfully use gold.

Dr. McDonnell, of Pennsylvania, said that it was a question as to whether we understand what conservatism in dentistry means. It means, first, the saving of teeth, if that can be done; and then conservatism in the modes, materials, and appliances used. It means that we should not advocate the doctrine that gold is the only material that should be used, and that failures with it are always the result of inefficient operations. This last doctrine is a great heresy. If all failures

are the result of defective operations, then dentists should warrant their fillings. Failures are not the result of inefficiency on the part of the operator, but of the character of the teeth; but these cases are making trouble between us and our patients. All mankind has deteriorated, and that has caused a deterioration in the teeth. The teeth of one person may be strong and firm, and fillings will preserve them; those of another are quite different, and the result will be different. He could recall a case of a central incisor in which the decay had been twenty years in reaching the pulp; many skillful operators had filled teeth that had been lost in a quarter of that time. While manipulation is the first necessity, it does not begin to be all; it is the structure upon which we work, the patient for whom we work, and what the work has to do after we are done with it, that makes the difference. In many situations, in many teeth, gold fillings, inserted by the best operators, are not the best thing. The most miserable empiric might fill a tooth with amalgam that would outlast the same tooth filled with gold by the best operator, because the shell of the tooth would not be broken. The skill used in such a case would prove destructive to the tooth. He had himself had a tooth filled with gold by the electric mallet, by as fine an operator as there is in the United States, and the filling had not remained long, though it was a beautiful operation, and took ten hours and two books of gold to put it in. The cavity was saucer-shaped, and in such a situation that the gold was struck obliquely in malleting. But he would not have that tooth refilled with gold for five hundred dollars, suffering what he did before, and taking the chances of failure. He did not blame the operator; but if we do this thing we shall have patients blame us. The reasons why teeth which are of a soft and chalky structure, in mouths where the fluids are vitiated, should not be filled with gold are very plain. Sometimes the gold would last longer than the tooth, and that is not necessary. There are other reasons, such as the inaccessibility of the cavity, the inability of the patient to endure the operation, the application of the dam, the clamp, and ligatures, which make the patient feel that if ever he gets out of that scrape he will never get into another one like it. The lack of the financial ability to pay for the operation is another reason. Conservatism in dentistry is the selection of materials and modes and appliances; it is not a quarrel between contour and partial contour.

Dr. M. H. Webb said that the failure of the operation upon Dr. McDonnell's tooth was the result of its being imperfectly done, not because it was a gold filling. He thought he could speak knowingly, because he had filled the tooth himself. It was a case which was very difficult to fill properly with gold, and he had depended mainly upon a screw, and was sorry he had done so. He could not see what the electric mallet had to do with it, nor why it should be blamed for it.

He asserted positively that next to the rubber dam, the electric mallet, properly made, adjusted, and operated, is the most valuable appliance we have. The material in this case was not to blame. It was the fault of the operator. It is better to put in amalgam than to extract the tooth, but there are other ways of saving teeth.

Dr. McDonnell thought the mallet was to be blamed. It had no doubt loosened the screws. It would have succeeded better if a hole had been cut in the cheek so that it could have been operated at right angles.

REMOVAL AND RESTORATION OF INFERIOR MAXILLÆ.

Prof. Peirce introduced a patient for whom an operation for the restoration of the jaw had been performed. He said that when first seen, the patient (a lad about fourteen years of age) presented himself, with his face much swollen, and considerable pus oozing from around a sixth-year molar, the appearance of which indicated necrosis of the inferior maxilla. He extracted the tooth, and did not see the patient again for three weeks; when he returned, the soft tissues had been absorbed from the socket of the extracted molar, exposing the process; the bicusps were very loose, the breath offensive, and pus was oozing around them. He was immediately put upon iodide of potassium, and his health, which was much broken down, rapidly improved, and the progress of the disease was stopped. The bone was necrosed, but had not yet separated; it was watched carefully, and the mouth kept clean, until a probe could be passed around the processes. This was on the 1st of January, and the patient was first seen August 1st previously. Soon after, the larger portion of the bone, extending from the condyle on the left side to the second bicuspid on the right, was removed by Dr. Garretson, there being only one portion where there was an attachment. Several pieces were subsequently removed. There is still a small piece of necrosed bone remaining, and a slight fistula. A rapid reproduction of new structure had taken place, and by the 15th of May a new bone had been formed; the ramus is now quite firm, and there is a very small amount of deformity. This is what would be characterized as conservative treatment.

Discussion.

Dr. Barker. There is something to be learned as to conservative dentistry and surgery from this case. This patient is of a marked scrofulous diathesis, and under the influence of medicine we see a restoration of the parts. This case teaches us to rely upon the recuperative efforts of nature itself; it shows the efficacy of iodide of potassium. There are other substances, for instance, the lacto-phosphate of lime, which have been extensively used in building up the system; and which might here be used with benefit.

Dr. Templeton inquired as to the history of this case, whether there had been any eruptive disease, such as scarlet fever, measles, etc.

Dr. Peirce. The most that could be learned from the mother was that the boy had caught cold and suffered from fever in July, and then his face commenced swelling. The fever lasted some three weeks—before he had been seen at all. The mother said it was not eruptive.

Dr. Barker. There are marks of scrofula in the face, and in some of the glands. Thousands of children born in the city have within them the germs of disease, and when exposed to very slight thermal influence the effects are very likely to fall upon the inferior maxillary. This bone and the tibia are more likely to suffer, being covered merely with integument. The influence of mercury and phosphorus upon the inferior maxillary cannot be explained upon any other known law. In this case little force was used in removing the sequestrum, which was most excellent treatment. Surgeons are apt to operate too quickly, and to use so much force that inflammation will set in. We should wait for the sequestrum to be entirely separated from its attachments.

Dr. Goddard, of Louisville, said that about two years ago he had a similar case, a miss about twelve years of age. Several physicians and dentists had advised the immediate removal of the bone, to which he objected. The patient had had the smallpox; she had had no trouble with her teeth or face previously. She was sent away for a week with a suitable wash and medicine, but did not return for two, when the bone was instantly removed, and the child got well.

(To be continued.)

MISSOURI VALLEY DENTAL SOCIETY.

THE annual meeting of the Missouri Valley Dental Society was held at Omaha, Nebraska, July 26th and 27th, 1876.

Resolutions relating to the death of Dr. J. Blake, of Brownsville, Nebraska, were passed. These expressed the high estimate in which Dr. Blake had been held as a man and as a dental practitioner, and the sense of loss felt by the society in his death.

The election of officers for the ensuing year resulted as follows :

President.—Dr. J. S. Charles.

Vice-President.—Dr. S. H. King.

Secretary and Treasurer.—Dr. F. M. Shriver.

Corresponding Secretary.—Dr. S. A. Billings.

Executive Committee.—Drs. C. Thomas, F. M. Shriver, — Paul.

Committee on Membership.—Drs. J. S. Charles, E. J. Woodbury, J. W. Roseman.

By a vote of the society, its name was changed from the Missouri Valley Dental Society to the Nebraska State Dental State Society.

Adjourned to meet at Lincoln, Nebraska, on the fourth Tuesday in July, 1877.

F. M. SHRIVER, *Recording Secretary.*

CONNECTICUT VALLEY DENTAL SOCIETY.

THE fourteenth annual meeting of the Connecticut Valley Dental Society will be held at Haynes's Hotel, Springfield, Massachusetts, commencing on Tuesday, October 17th, 1876, at 10 o'clock, A.M.

C. T. STOCKWELL, *Secretary.*

CORRESPONDENCE.

DEAR COSMOS,—As I sit at my desk enjoying the cool breezes fresh from the mountains, and think of the torrid heats you, poor Mr. Editor, have suffered during this centennial summer, I sympathize, and could wish you to more congenial climes, and then I wonder whether, with the multitudes of conventions assembling, or to assemble, in Philadelphia, you are not surfeited with reports. Now we, in Europe, this year, have no cause to complain of heat. It has been, and is, delightful summer weather, thermometer rarely going above 80° F.

It is unfortunate that the holiday season always comes when mind and body are most in need of recreation, for then it is that the American professional mind, wherever found, takes repose in a peculiar way. Then are appointed conventions, and then the average American, midst sweltering heats, talks and talks, and sincerely believes he is recruiting his strength by the process. I am not disposed to believe him entirely wrong, for change from the monotonous round of daily life must have a value, though it seems devoid of restful conditions.

Affected by the general mania, I started a week ago for Paris, to attend the meeting of the American Dental Association of Europe, to be held there on the first of August. Arriving in the early morning, I found that the true American spirit had not departed from the exiles, but that nearly all the members were present, representing widely-separated portions of Europe. London was there in Field and Pritchard; France, by Crane, Kingsley, the Du Bouchets, Parmley, and Gregory; Belgium, by the brothers Fay; Germany, by Abbot, Fuchs, Cohn, Jenkins, and Truman; Switzerland, by Wright, Doremus, and Williams; Italy, by Van Marter. Besides these were a number from different parts, not

members, drawn by the increasing interest attaching to the convention. If no other evidence existed that such a gathering was needed in Europe, the anxiety manifested to become part of it is ample proof at least of its supposed value. Dentists in the large cities at home can hardly realize the feeling with which dentists here come to such a meeting. It is the yearly pilgrimage, not taken grudgingly, but thankfully, and with an enthusiasm refreshing to witness. To us in America, the annual convention is but another name for an annual bore. To be sure, we highly appreciate the social interminglings, but we do not regard it as an integral part of our dental life. Not so here. Isolated as all are, surrounded by foreign ideas, foreign tongues, foreign habits, we look forward to the meeting not wholly as to its scientific character, but that there will be met genuine American dentists influenced by true fraternal feeling. Such seemed to me the sentiment prevailing among those assembled in Paris August 1st, 1876. We were not enough to fill the saloon of the Grand Hotel, but what was lacking in numbers was made up in genuine enthusiasm.

The meeting was organized Tuesday morning, being called to order by Dr. Abbot, of Berlin, president. The morning session was mainly devoted to the election of new members, and in this I was glad to find that the association had taken high ground. They will not admit any to membership unless fully satisfied as to ability and good standing. The mere charlatan, whether with the degree or without it, cannot hope to enter. The result is a membership fully equal, in point of ability, to that of any organization with which I am familiar. As this was my first introduction, I was interested, as an outsider, to note these facts and to draw my own conclusions. To me they indicate valuable professional results in the future. Societies, as well as individuals, must develop through gradual unfoldment. The progress of this association has been marked, and its influence far-reaching; but the incentive to still further progress lies in the attrition of mind with mind in the association itself, and, if I read the signs aright, it will be proved that American dentistry in Europe is in the right hands; and the impress it will leave upon the professional and popular mind will be of the most valuable character.

The afternoon of the first day was largely devoted to the election of officers. Dr. Abbot gave way to Dr. Field as president. Dr. A. made a short and very characteristic address, in which he discussed the duties of dentists, claiming that, if the possibilities which follow accepted opportunities are worked out to legitimate ends, the result must be good to the individual. The treatment of children's teeth was to his mind a large field, with many, as yet, unexplained problems awaiting elucidation. Labor here tended to the cultivation of the sympathetic side of our natures, which is sometimes superior to mere scientific

work. Gain the confidence of childhood, and mature years will give the trusted friend. Confidence once established is never lost. It is more important to be a gentleman in practice than to be a scientific physician.

Dr. Field, on taking the chair, trusted that a generous rivalry would actuate each member, but that while independence of thought and freedom of speech were maintained there would be a kindly forbearance and a disagreement without unkind feelings.

The serious business of the meeting was then taken up by the discussion of "Operative Dentistry." The old yet always interesting subject, the preservation of the pulp, came up, in which Drs. Gregory, Pritchard, Fay, Jenkins, Van Marter, Field, Kingsley, Abbot, and Truman took part. Pritchard raised the point, "What do we mean by an exposed pulp?"—a pertinent question, it seemed to me. As generally construed, we wait for a decided opening that may be felt, seen, and explored, but wholly neglect those minuter exposures, found in every cavity, where the soft structure of the interior tubes is left exposed to thermal and acid irritation without any anxiety as to results. The summation of experience, in this department of practice, leads me to the conclusion that the results of capping with oxychloride, in Europe, are about the same as in America, systemic conditions and climatic influences having largely to do with success or non-success. For instance, Dr. Gregory, of Lyons, France, had had such poor results that he was completely discouraged, while, on the other hand, Dr. Abbot, of Berlin, was not willing to destroy a pulp in any case without first resorting to capping. Dr. Field, from his two stand-points of practice, Geneva and London, indorsed the position taken by Dr. Truman, that climatic influence must be largely taken into consideration in arriving at results. From Dr. Kingsley's remarks, I should judge that his success in capping, in Paris, was not encouraging; indeed, he doubted whether we were justified in performing a piece of work that might produce lasting injury to the patient.

On the morning of the second day we had two papers, one by Dr. Crane, of Paris, and the other by Dr. Paetsch, of Berlin, on "Mechanical Dentistry." The discussion naturally went from taking impressions to celluloid work, the latest shuttlecock in a mechanical way. It seems questionable whether we will ever arrive at any harmony of opinion in regard to this material. The experience on this side has not been extensive, as there is but little inducement to use it. The complaint was universal that it changed color, and Dr. Kingsley charged it with being the "dirtiest material" that had ever been introduced. This sweeping criticism was objected to on the ground that all materials worked up from a plastic condition, rubber not excepted, became offensive around the teeth, and that want of care in manipulating celluloid had, perhaps, as much or more to do with this than the material. The impression

seemed to be that in the evaporation of camphor there must necessarily be an absorption of secretions to take its place, and that eventually decomposition and general nastiness must result.

Interlaken, in Switzerland, was chosen as the place of meeting for next year. As the place is attractive, we hope some of our good American brethren will work off the fatigues of this centennial year by a trip to the cooler and more bracing atmosphere of Switzerland, and at the same time aid their professional brethren hereaway by cordial sympathy and good-fellowship.

At the afternoon session, the subject of "Operative Dentistry" was again taken up, and papers by Drs. Field, Thomas Linn, and Eastlacke were read, the latter confining his paper to the electrical mallet. As these papers covered a wide field, the discussion ran into some special topic, and sensitive dentine claimed and received the most extended consideration. The same difficulties at arriving at any satisfactory results were apparent here as on the other side. The writer of this called attention to the hopelessness of treating this or any other pathological condition, unless we reasoned logically from cause to effect. The cause lay remotely in the minute fibers of sensation passing through the tubes. The possibility of entire removal of sensation, without destruction, could not be entertained, but the prolific cause of exquisite sensation must be looked for in acid depositions, whether in the cavity, at the necks, or wherever sensation of a marked character was to be found. The cause being understood, proper treatment would result in the removal of the effect. The treatment he had urged repeatedly, for several years, was based on the simple fact that acid being the irritant an antacid was the remedy, and for this purpose the bicarbonate of soda was the best, though others had been used with varying degrees of success. By packing the cavity full of the bicarb., and allowing it to remain for ten or fifteen minutes, sensation will have largely disappeared. The first effect is decided pain, passing off in a moment.

The subject then drifted to materials for filling, in which came prominently forward Dr. Abbot's plan of filling with a combination of tin and gold. Dr. A. declines the parentage of this, but he certainly has the merit, if any exists, of bringing it out. The merits or demerits of this mode seem not to be fully understood, nor have those who have operated with it apparently comprehended why it is better than tin alone. But when such men as Abbot, Jenkins, Fuchs, and Cohn assert that the fillings increase in density to an extent greater than tin and almost equaling amalgam, while at the same time there is no apparent galvanic action, we have no right to urge a counter-judgment based on mere theory. As Dr. Wright had a letter bearing upon this, from Dr. Palmer, of New York, it was read. If his conclusions are

correct, then metals so combined act on each other rather than on the tissue surrounding them. This is, in brief, as I understood him. If this be true, we can understand the reason of the change in the crystalline character of the metals. It does not seem very clear to me, however, admitting this result, that the other, secondary action on the tissues, will not take place. The subject is an interesting one, and, in its possible scientific results, transcends the mere tin and gold filling. Operators vary in the mode of manipulating. Dr. Jenkins places his tin between gold-foil, the latter always on the outside. Others keep the tin outside. All, however, agree that by either process it is worked much more readily than gold or tin alone. Non-cohesive gold is alone used.

The morning session of the third day was mainly occupied in the consideration of dental anomalies. Dr. Fay presented a model of an interesting case of epulis, which he had successfully treated. Other cases of interest were brought to the notice of members,—malpositions of wisdom-teeth, etc.

Dr. Williams, of Geneva, exhibited some specimens of crystalline gold, of his own manufacture, that he thought might prove superior to any yet made. He had been experimenting in this direction for some time.

Dr. Cohn presented hard rubber clamps. These are formed from black rubber, and, as they are easily made, may be prepared by every dentist in designs to suit himself. If I may be allowed to judge without practical experience, they ought to retain their position as well as steel, and be more comfortable to the patient. Before being placed in position they are gently warmed.

The afternoon session of this day was decidedly the most interesting of the series. The discussion was upon two papers, one by Dr. Wright, on the "Causes of Caries," and the other by Dr. Van Marter, on "Climatology, and its Relation to Teeth." These were valuable contributions, the latter exceedingly suggestive, and both ably prepared.

The position assumed by Dr. Van Marter was, if I understood him, that climate, by a gradual change, made it possible for types of teeth to exist so distinct in character as to be easily recognized. The reading was followed by some exceedingly cogent and lucid remarks from Dr. Jenkins on the same subject. He sustained the general position taken by the paper, calling attention to what he considered marked characters or types of teeth in the different European races he had met with. Remarks were made by others in corroboration of the views taken. The subject is a deeply interesting one, and deserves extended observation. It is only in this way that correct conclusions can be arrived at. The subject was placed in good hands for investigation during the year, and it will be a disappointment if some progress is

not made. Observations, however, to be of much value, must cover a series of years as well as a large extent of territory.

After the appointment of the regular essayists for next year, the meeting adjourned.

The social aspects of this meeting were all that could be desired. The members dined and wined together in and out of cafés and gardens, and the profession resident in Paris did everything possible for men to do to make it pleasant for the members. The visitors will not soon forget the self-forgetfulness and hearty hospitality of Drs. Du Bouchets (father and sons), Crane, Kingsley, and Parmley. The good results of having this meeting in Paris were quite evident. It drew men together that ought to be together. Antagonizing influences have too long operated to keep the profession separated. There is sufficient material there to make a good local organization, and the profession in Paris owe it to themselves to speedily have one. It would do more to put down charlatanism, so prevalent, than any other course. This detestable parasite finds a hot-bed growth in this city, and, it seems to me, has laid a paralyzing power over the best men there. If the charlatan element was confined to ignorant pretenders it might be suffered to find its own level, but, unfortunately, it flaunts the diploma in your face, and even aspires to educational positions. This state of things can only be met by a united front and a general spread of intelligence among the people.

It was repeatedly asserted to me in Philadelphia that it was impossible to practice on the Continent in the same manner and with the same conscientious devotion to the best interests of the patient as is exhibited in the United States; that, in a certain sense, all were tinged more or less with quackery. My period of observation has not been long, but quite long enough to satisfy me that professional work is done as thoroughly and as conscientiously as anywhere in our own country, and the reward is ample. The days when quacks, with or without diplomas, can longer deceive and defraud are fast passing away. All honor, then, to those who, in every large city in Europe, are quietly but persistently keeping the standard of American dentistry spotless before the people.

As I close my letter I receive the information that my colleague, Prof. Wildman, died suddenly on the 25th of last month. It is difficult for me to realize that I shall never meet him in the active work of professional life again. He was one of the few men of whom it can be truly said he was an unselfish worker. His labors have been incessant through a long professional life, and they have resulted invariably to the benefit of the profession and nothing to himself. He was a thorough investigator, and wonderfully exact in all his manipulations. To him dentistry owes much in minor things, but his name will ever be

associated with the early improvements he made in "porcelain teeth." Indeed, without his germ, artificial teeth would be a failure. His investigations in rubber, and more recently in celluloid, bore all the evidences of an analytical mind and a patient investigator. Yet, notwithstanding all this, he goes down to the grave comparatively unknown. Genuine merit rarely in this world receives its due reward; but in the memory of those who knew him best, Dr. Wildman will live as one of the ablest, if not *the* ablest, scientific mechanician in our ranks. The generation of the fathers is passing away. Who will be able to wear the mantles they let fall? The number is so rapidly diminishing that the time must soon come when the mechanism of the past will be classed with the lost arts. But the influence of a man like Dr. Wildman can never be lost. It is the ever-widening ripple in mental life, growing broader and deeper as it extends. He planted, and the fruit will be evident wherever a student of the Pennsylvania College of Dental Surgery lives and works; and, as they drop a tear to his memory, will recall, with feelings of thankfulness, that he led them through the wilderness of crude ideas to clearer views of professional excellence.

Will you permit me to call the attention of my correspondents, the world over, to my present address?

Trusting that a general good time was had at the different conventions held in the Centennial City,

I remain sincerely yours,

JAMES TRUMAN.

16 BLEICHSTRASSE, FRANKFURT-AM-MAIN, August 18th, 1876.

EDITORIAL.

THE REPORT ON DENTAL LITERATURE.

The Pennsylvania Journal of Dental Science devotes three pages of its September issue to a criticism of the report on "Dental Literature" read before the American Dental Association by Dr. M. S. Dean, though confessedly without having heard or seen the paper in question. It, however, came to the ears of the editor of the *Journal* that in the said report Dr. Dean "drew an invidious comparison between *The Pennsylvania Journal of Dental Science* and its editor and the DENTAL COSMOS and its editor."

We had not the pleasure of hearing the paper, and have not even heard of it, except through the editorial referred to, and for the present take the liberty of declining to accept the information as worthy of confidence. If, however, the statement prove to be correct, it will not justify the *Journal* in having confounded Dr. Dean with the DENTAL

COSMOS or with its editor, as is done throughout the article. We are not responsible for Dr. Dean's opinions or utterances.

The *Journal* has seemed to take pleasure in silly flings at the DENTAL COSMOS, which, as they amused it and harmed no one, we were quite willing to indulge it in; but these failing to secure the coveted distinction of a notice, it has turned its attention to the manufacture of opinions to be put, ready-made, to the credit of the DENTAL COSMOS. Witness the following, which occurs in a self-eulogy in the editorial in question: "A journal which, Dr. Dean's opinion to the contrary notwithstanding, has had the highest endorsement of its editorial management, which, the opinion of the COSMOS to the contrary notwithstanding, has flattering testimonials from some of the very best men of the profession, men whose opinions we highly prize and which are worth having."

If this means anything, it is intended to convey the impression that the DENTAL COSMOS has expressed the opinion either that the *Journal* has not received or has not deserved the flattering testimonials alluded to.

Now, the fact is that the DENTAL COSMOS has expressed no opinion whatever of the *Journal*, and has not even made allusion to it, except in calling its attention to its appropriation of matter from our pages without credit. How, then, can the editor know our estimate of him or of the *Journal*? We cannot allow him to interpret our unwritten thoughts. If it is safe to allow him to assume that we hold one opinion to-day, who knows what we may be charged with to-morrow? Evidently there must be a limit to this gratuitous manufacture of sentiments for us, or we shall expect him to accuse us before long of thinking that the editor of the *Journal* belongs to the genus *Asinus*.

CROWDED OUT.

THE amount of space which it has been desirable to accord to the proceedings of societies, has compelled the laying over of various matters already in type, including Dr. Chupein's reply to Dr. Webb.

PENNSYLVANIA COLLEGE OF DENTAL SURGERY.

THE removal of Prof. Truman to Europe, and the decease of Prof. Wildman, made two vacancies in the faculty of the Pennsylvania College, which have been filled by the election of Dr. Charles J. Essig to the chair of Mechanical Dentistry and Metallurgy, and of Dr. Edwin T. Darby to the chair of Dental Histology and Operative Dentistry. These gentlemen have had special training qualifying them for the positions, the first named as Demonstrator in the Philadelphia Dental

College, and the latter as Demonstrator in the Pennsylvania College. The deanship of the faculty is held by Dr. George T. Barker, who was elected successor to Dr. Wildman upon the resignation of that position, by the latter, a few months before his death.

PENNSYLVANIA STATE EXAMINING BOARD.

THE Board of Examiners appointed at the last meeting of the Pennsylvania State Dental Society, in compliance with the law regulating the practice of dentistry in Pennsylvania, desire that each applicant for examination before the said Board should make known his wish, without delay, to one of its members.

The Board is desirous to accommodate all applicants, and hereby give notice that during the month of December proximo—day and place to be hereafter designated—it will meet in Pittsburgh.

The Board consists of Drs. C. N. Peirce, 1617 Green Street, and E. T. Darby, 4000 Chestnut Street, Philadelphia; C. S. Beck, Wilkesbarre; J. S. King, 73 Seventh Avenue, Pittsburgh; W. E. Magill, Erie; J. C. Green, West Chester.

BIBLIOGRAPHICAL.

MICRO-PHOTOGRAPHS IN HISTOLOGY. BY CARL SEILER, M.D., in conjunction with J. GIBBONS HUNT, M.D., and J. G. RICHARDSON, M.D. Philadelphia: J. H. Coates & Co. April, May, June, and July, 1876.

As a first attempt in an entirely new field, this effort to demonstrate histological and pathological facts by means of photography deserves such a helping hand as jealousy alone refuses to earnest neophytes in science or in art.

The design of the work is to give exact delineations of tissues, instead of the more or less highly-colored idealizations common throughout our text-books; or, in other words, to substitute, as a standard of comparison, photographic truth for what is frequently diagrammatic error. This object is certainly a praiseworthy one, and must command the approval of all unprejudiced instructors.

The only question that remains is, how far Dr. Seiler has attained to the proposed desideratum; and we must do him the justice to say that many of his pictures are admirable, and equal if not superior to any similar productions we have ever seen. Such photographs as No. III., of Epithelium, No. X., of Enchondroma, and Nos. XIII. and XIV., of normal and diseased Hepatic tissue, are superbly executed, and, we venture to assert, will convey to most students and many teachers of histology

clearer and better (because more precisely accurate) ideas of the structures depicted than would be gained from whole volumes of old-fashioned diagrams.

We trust the editor will be encouraged to elevate every one of his illustrations to this high order of excellence, and are glad to learn from Mr. Coates that the merit of the publication is so far recognized abroad that the well-known London house of medical publishers, Messrs. Macmillan & Co., have contracted for an edition to supply the wants of English subscribers.

In view of the success thus early attained, we cordially welcome the "Micro-Photographs in Histology" as a new and most important aid to the dissemination of downright facts, whereof, as John Ruskin declares, "the world" (and especially, we believe, the medical world) "is more in need than of anything else."

HINTS AND QUERIES.

WILL some one who has been successful tell us how to treat a pulp which is inflamed from exposure? I have generally succeeded in doing what others have in these directions, but, after a number of years' trial, I have concluded that an inflamed pulp is a "goner" in spite of me. I have used all the remedies recommended, and many that my judgment told me would be good for other tissues under like circumstances, and have always failed. Sometimes they seemed to be well, and I would cap and fill, but would soon discover them to be dead. I have concluded that it is only congested pulps my friends save, and not inflamed ones. Let the experienced tell us the *modus operandi* of treatment,—the *why* of the use of certain remedies and their action on the tissue.—M. C. S.

WILL some one be kind enough to tell me the best remedy to prevent sloughing of the gums after the use of rhigolene as a local anæsthetic? also, the best remedy after the gums have begun to suppurate? Is there any other local anæsthetic that can be used with safety?—H.

It is a mortifying fact that joints of block teeth before vulcanizing are perfect, and when they come out of the flasks they often are open and black. Is there any remedy?—W.

REPLY to B. A. M., in the August DENTAL COSMOS.—Celluloid, after being worn a considerable time, will change to a lighter color than when first made. Plain teeth can be worked to better advantage than gum teeth, and they adhere strongly enough for permanent work. The thing requisite for the successful working of celluloid is sufficient heat. If you work your material hot enough, and, when screwed down, allow it to cool of itself, you will have no broken blocks, shrinking of plates, or any other trouble. I screw down my flask when the heat reaches 300°, and do not remove it from the oil until the heat gets below 240°, and let it get perfectly cold before removing it from the flask. I have never had a failure in a single instance. I use the oil apparatus for the reason that by it I think I can get more heat than by any other apparatus in use. I have seen and have mended numbers of cases where the teeth were broken from the base, and in every

case the pins remained in the base. I have yet to see the first case where the pins were pulled from the celluloid.—A. H.

REPLY TO B. A. M., Rockport, Ind., who asks, "Has any one been using the celluloid base with plain teeth for permanent cases, etc.? Will the gums thus made hold their color?"

The celluloid base has been in *constant* use in my laboratory for several years. For full upper dentures I prefer it, decidedly, to rubber, and almost always use the plain teeth with it, producing a beautiful piece of work. By using plain teeth you not only avoid the risk of "cracking" the sections, but you can "set them up" in such a manner that they will articulate to better advantage, where you have the whole or a portion of the natural inferior set, and will certainly present a more life-like appearance. The recent plates of celluloid which have been supplied to the profession have an excellent color for the gums, and retain it sufficiently well for all purposes. If "B. A. M." is using the steam apparatus, and supplies himself with teeth from *first-class* manufacturers, he will find, by giving the material sufficient time to soften, and turning the screw down slowly, his piece will come out with the *gum teeth* without a "crack."—A. H. HILZHEIM, Jackson, Miss.

I WISH to say to my dental brother, B. A. M., who complains that he is "troubled a great deal by block teeth cracking," that I used to be annoyed occasionally in the same way, but am not now. I do not pack by guess, but use Woodward's rubber gauge for determining amount of rubber to use, adding a small piece for surplus. I arrange the rubber carefully in the mould according to the relative thickness of the different parts of the base-plate, and pack carefully; but the main point is never to place a flask, which is *hot* from packing, into *cold* water to vulcanize, nor flasks *hot* from the vulcanizer into *cold* water to cool,—or, in other words, avoid *sudden* changes of temperature to the teeth while in the flask. Permit me to say, in support of the above and for the encouragement of B. A. M., that I have cracked but one section in the last five years, and that, I believe, was caused by the shrinkage of the rubber back of it, which, at that point, was of unusual thickness; neither have I spoiled a case from either under- or over-packing in that time.—H. A. ROBINSON, D.D.S., Foxcroft, Me.

REPLY TO B. A. M.—Plain teeth are far superior to gum for use with celluloid, from the ease with which they can be arranged and the freedom from the stiffness often inseparable from sectional teeth. Celluloid as now furnished approximates gum-color closely, and when artistically carved makes a presentable gum, which holds its color well. No trouble need be anticipated in regard to plain teeth separating from the base, as, other conditions having been observed, they will be sufficiently firmly attached for permanent dentures.—R. G. H.

REPLY TO F. F. D., in the June DENTAL COSMOS.—Rubber dams may be restored to their original usefulness by covering the perforations with waste pieces of rubber, using a varnish made by dissolving gutta-percha in chloroform. The varnish will work to the best advantage if made about the consistency of cream, and will be found to work successfully in many other operations about the mouth.—D. R.

I HAVE before me a cast of the mouth of a college patient, a German woman of moderate stature, which measures (the cast, not the woman) three and one-eighth inches across, by two and three-eighths inches from front to back. A special cup and special flask for vulcanite plate had to be made for this case.—J. B. HODGKIN.

THE
DENTAL COSMOS.

VOL. XVIII. PHILADELPHIA, NOVEMBER, 1876. No. 11.

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 509.)

Sulphate and oxide of zinc.—This preparation, which is made by mixing thoroughly in a mortar *one* part of calcined sulphate of zinc and *three* parts of calcined oxide of zinc, is one of the most recent suggestions for the capping of pulps. By the addition of the sulphate to the oxide a powder is formed which, made into a paste with *water*, hardens quite promptly and with a greater density than plaster of Paris.

The chief advantage claimed for this capping is its non-irritation, which, I think, must be conceded as desirable, though time has already proven that even the absence of irritation is no *guarantee* for universal success.

Hydrated oxychloride of zinc.—I have accepted this nomenclature from the fact that it expresses, sufficiently well for practical purposes, the proposed modification of the ordinary oxychloride of zinc (so called generally) by the addition of one part of water to two parts of the fluid which is prepared for mixing any of the various oxide of zinc powders.

It is suggested that a powerful astringent is substituted for an irritant by this dilution of the strong solution of chloride of zinc; and that thus a reasonably beneficial application is placed in proximity to pulp-tissue in place of one *possibly* deleterious, while at the same time other medicinal complication, such as mixtures containing creasote, carbolic acid, or oil of cloves, is avoided.

Much comfort to patients, and a fairly increased share of *apparent* success, is claimed for these latter "pulp-coverings," though, as yet, far too short a time has elapsed since their introduction for anything like positive statements as to their value.

In conclusion, I would say that, so far as my own experience teaches, the capping of exposed or almost exposed dental pulps is an operation of decidedly questionable success, although it is unquestionably successful in very many instances; that the value of the living pulp is exceedingly great, giving to its tooth almost every chance of future *permanent* usefulness, in place of the almost positive certainty of future liability to trouble, *eventuating* in the loss of the organ; therefore, that it is not only warrantable, but professionally imperative, that every effort should be made for the preservation of pulp-vitality, subject to the following *exceptions*:

1st. In cases where pulps have already given decided evidence of marked irritation, as evinced by several attacks of *paroxysmal* pain, in connection with a *probable future which would preclude the possibility of relief in the event of suffering*.

2d. In cases where the general systemic condition is decidedly adverse to the probability of success, *and so much suffering is the concomitant of other CHRONIC disease, as to render any possible additional pain decidedly detrimental*.

Chronic disease is the exception made here, from the fact that *odontalgia* from almost exposed or exposed pulp during *acute* illness, would only demand that temporary relief which is almost invariably given by the application of acetate of morphia, formed into a paste with oily carbolic acid or oil of cloves (acetate of morphia one grain, oil of cloves one drop). This is made upon a small pellet of cotton-wool, dipped first in carbolic acid or oil of cloves, and then partially covered with the paste.

The cavity having been cleansed from food and *débris* by syringing with tepid water, and by instrumentation, if necessary, the application is placed *gently* into position, and covered either with one or more larger pellets of cotton-wool dipped in carbolic acid or oil of cloves, or, if practicable, with the more secure stopping of gutta-percha, carefully introduced so as to *make no pressure*.

3d. In cases when, after a plain presentation of the subject, the immediate immunity from all possibility of subsequent interruption resulting from failure is shown to be a business, or other important necessity.

Under these circumstances, I deem it better to devitalize the pulp, and introduce such filling as shall be regarded as "permanent."

COMPLICATED CARIES.

Complicated caries is that stage of decay which requires for its successful treatment the devitalization and extirpation of the dental pulp. It is remarkable with what justice the term "complicated" attaches itself to this form of dental disease in the minds of all educated practitioners of dentistry.

Probably no subject within the range of our practice possesses such wide complications, or presents such scope for unpleasant, and, indeed, serious results. Certainly no other, at the present day, seems more directly important to the success of the dentist, be he old or young, or more immediately connected with much of the satisfaction and comfort of most of his patients.

When it is remembered that as the "train" of this condition follow the sequences of periodontitis, alveolar abscess, and necrosis of the roots of teeth, and portions of maxillæ; and when, beside all these, we find, as constant concomitants, disease of the antrum, bad breath, dyspepsia, deafness, neuralgia, paralysis, otalgia, cephalalgia, and amaurosis, dependent so directly upon this local cause as to be promptly and permanently cured by proper dental treatment, after long-continued general medication has proven utterly useless, then it is that we begin to appreciate properly the exceeding extent of human suffering that it may be ours to relieve.

While it is true that some of these diseases are sequences which require much time (some of them years) for their development, it is none the less sure that, in a vast majority of instances, they are *as certain to come as they are slow in coming*, and that for these reasons it behooves the dentist that he should be able to trace *effect* back to *cause* with the greater certainty, because to others the trail is lost by distance and covered up by time.

But, on the other hand, many of the most painful and most serious of these, as neuralgia (especially, but not exclusively, *facial* neuralgia), paralysis, otalgia, cephalalgia, and amaurosis, are frequently the *immediate, though, to the patient, not in the least degree referable*, concomitants with that pulp-irritation which, if it bids defiance to conservative treatment, yields to "devitalization" and "extirpation."

Dental pulps are irritated by both external and internal irritants.

I have already given, at length, remarks upon such irritants as are liable to cause pain in cases of almost exposed or completely exposed pulps, *prior to any dental manipulation*, under the head of this "Third Cause of Odontalgia" (p. 281, June COSMOS, 1876), and shall, therefore, only briefly recapitulate, at this time, mainly for the purpose of giving completeness to the list of pulp-irritants in this connection.

EXTERNAL IRRITANTS.

- 1st. Infiltration of salt, sweet, or sour condiments.
- 2d. *Direct contact* with foreign bodies.
- 3d. *Pressure* of foreign material.
- 4th. Thermal irritation.
- 5th. Mechanical irritation.
- 6th. Medicinally.

- 7th. Prevention of exudation by filling.
- 8th. Loss of tooth-substance from attrition.
- 9th. Fracture of tooth.
- 10th. Disease of surrounding parts.

INTERNAL IRRITANT.

- 11th. Pulp nodules.

I desire to recall the fact that such comments as were given upon pulp-irritants in the former pages referred to, related exclusively to possibilities *prior to capping or filling*, and were equally exclusively dependent upon *caries*.

I now propose discussing the subject from that general stand-point which, containing fully all considerations pertaining to "complicated caries," shall also include all local causes of pulp-irritation *liable at any time, or under any circumstances, to necessitate devitalization of that organ*.

(a) *Infiltration of salt, sweet, or sour condiments*.—Having given the fact that *size* of lesion is no criterion for the amount of pain which these irritants can inflict, and having directed attention to their *searching* character, as evinced by their permeation through impacted food and *débris* in large cavities, it now becomes necessary to inform as to the peculiarities which exist in connection with filled cavities.

I think it may be safely stated that *most fillings* are more or less imperfect, and that the degree of imperfection is *generally* in exact ratio with the difficulty of introduction. This being conceded, it is the point of danger which I wish to impress as regarding pulp-irritation.

In teeth peculiarly susceptible to the influence of these irritants it will be found that fillings upon the articulating faces of the teeth, which are so *slightly defective* as to defy detection, except with the keenest scrutiny and finest instrumental examination, will yet permit exceeding irritation as the result of the forcible infiltration due to mastication.

It becomes, therefore, true, that dangerous filtrations into cavities containing fillings are those in which, from their inaccessibility, comparatively trifling defects have permitted the undetected occurrence of very extensive decay beneath the plugs.

It is in soft, white, chalky teeth, in positions at and beyond their necks, either fairly between teeth or under the free margin of the gum, that almost complete and even complete exposure of pulps is effected without sufficient pain to the patients to cause any apprehension of even moderate danger.

(b) *Direct contact with foreign bodies*.—I have stated that the presence of foreign material in contact with pulps is sometimes sufficient to cause pain, but that frequent instances are reliably recorded where this

has not only been *tolerated*, but recuperative efforts have been made, eventuating in that perfect protection which guarantees the maintenance of healthy vitality.

With the present statistical information of our profession, I am unable to give any reliable information as to the average of *uncontrollable* irritation resulting from this irritant, but I can only say that my own experience is, that comparatively few *completely exposed* pulps will bear that direct contact with foreign material, be it vegetable, mineral, medicinal, chemical, or metallic, which results from even the most careful manipulation which is recognized as essential in dental operating.

Food must be completely washed from the cavity; carious enamel, and, to a certain extent, dentine, must be excavated from the external portions of the cavity, to insure any benefit from the filling. Exceeding care may be exercised that the pulps shall not be wounded or even touched. Sufficient softened dentine may be allowed to remain as a partially protecting matrix, and this may be *properly* alkaliied or disinfected; the pulp may be soothed with the most approved medication, if indicated; the filling material may be non-irritating (except that it be not vital), and it may be *properly* introduced, *and yet* the pulp may die, and, I am forced to assert, *does die*, in a majority of instances.

I have italicized the word "*properly*" here, because I am aware that it is contended that the death of the pulp is the *proof* that the operation is *not properly done*, and I wish to enter my protest against this reasoning.

I think that it cannot be denied that my position, my inclination, and my practice have all combined to give me opportunity for extended observation in this direction.

Located in the immediate center of one of the largest cities of our country, and having a practice almost exclusively devoted to the "treatment" of teeth, it is but natural that the consecutive and linking experiences of nearly thirty years should have been something unusual; and it is upon this basis that I dare to state that if non-success is the criterion as to *improperly* performed operations, a great amount of improper operating is done by those who are, I think, *properly* regarded as exceedingly intelligent dentists, excellent manipulators, and in every respect worthy to be called the "good" men of dentistry.

I have, in hundreds of instances (this is not in the least exaggerated), found peridental irritation and alveolar abscess, caused by devitalized pulps under work so exquisitely performed, and (according to my light) with so full an appreciation of the requirements of the case, that I have been constrained to say to the patients that the only quality their operator seemed to lack was the superhuman power of *maintaining life*. To call this "improper manipulation" would seem to me nothing short of arrogance, and the more so as I can do no better!

It is from these results that I regard *direct contact* as liable to produce death of the pulp, even after the additionally irritating power of putrescing food, etc., has been precluded by the operation of filling.

(c) *Pressure of foreign material.*—It seems unnecessary to more than mention this cause of irritation, for the result is usually sufficiently prompt to make it an unmistakable diagnosis.

When undue pressure is made upon an exposed pulp, or one so thinly covered as to be in an equivalent condition, pain is usually the almost immediate response.

In this event, I regard it as unwise to permit the continuance of this pressure, even if the pulp *seems* to accommodate itself to circumstances, as indicated by a gradual cessation of sensation; for it is reasonable to infer that before much time has elapsed, that slight irritation, though proving insufficient for the immediate induction of continuous suffering, will be found amply capable of causing that increased flow of blood to the pulp, which it will be unable to tolerate in consequence of its now complete and unyielding surroundings.

With the uneasy sensations which now soon supervene, the pulp gradually passes, either very painfully, or almost painlessly, into a state of congestion, which causes death.

Therefore, any pressure which causes the *least* response should, on general principles, be removed, and a return to comparative normality be permitted, by "removal of the cause," or induced by appropriate soothing medication, such as an application of either laudanum, camphor, chloroform, aconite, or oil of cloves, either alone or as paste, with acetate of morphia.

(To be continued.)

DENTAL EDUCATION.

No. 9.

BY ROBERT ARTHUR, M.D.

In the preceding papers of this discussion I have endeavored to show that dentistry is a specialty of medicine, and I have contended that a clear comprehension of the principles underlying dentistry, as a scientific pursuit, renders necessary a knowledge of what is understood by general medicine. This is now the settled opinion of many, I think I may venture to say, of most of the more intelligent members of the dental profession in this country. So well satisfied are they of the truth of this view that they are determined to leave no effort untried to bring it into actual application to their pursuit.

This relation of dentistry to medicine was recognized by the projectors of the present system of dental education, but their views in

this respect are now, and were even at the time of the establishment of the first dental college, considered, to some extent at least, too limited. It is to be regretted that, at that period, the position which we are now seeking to reach was not taken, and instead of so narrowly limiting the collateral branches, as they are termed, a full medical education had not been required.

I have endeavored to show, from the statements made by the faculties of the schools at present in existence in this country, that these schools are far from remedying this defect. They have, indeed, in some respects, contracted instead of expanded this part of the course of instruction.

I have endeavored further to show that in the attempt to teach, imperfectly as it is done, these collateral branches, as they are termed, the dental schools have been compelled to neglect, to a considerable extent, the requisite technical instruction. Whether I have succeeded or not in establishing these propositions, there is no question that the belief prevails to a great extent that they are correct.

The question then comes as to what, in the present and future interests of dentistry, is to be done to remedy the defects referred to?

If dentistry is not a specialty of medicine, but is a merely mechanical vocation, as has been charged, why should any attempt be made to make it appear otherwise? Why should the poor fellow, who has neither the preliminary education nor the brains to have the faintest comprehension even of the meaning of the technical terms employed, be compelled to listen to long disquisitions upon physiology and histology, when all he wishes to know, and all he can discover that is worth knowing, is how to fill, extract, and insert teeth?

But if dentistry is something more, if it is really, to a certain extent, a scientific pursuit, and if any attempt is to be made to reach it with reference to its character in this respect, let it be done with some degree of thoroughness. It is difficult to understand why the attempt should be made to teach pathology, etc., under conditions rendering it quite impossible, for obvious reasons, that they can be well and thoroughly taught. Medical colleges are open to all who may choose to enter them. The course they offer must of necessity be more thorough, and although embracing many topics that may not be of practical value to a dentist, are so closely associated in a broad system that it is difficult to determine which should be discarded. But I am by no means of the opinion that a medical college is able to offer an adequate education for a dental surgeon of even a theoretical character. For this reason, while I am decidedly in favor of giving dentists a medical education, I am decidedly opposed to any step which looks toward putting dental education under the control of medical schools, even if they were disposed to take any such control. So far from being opposed to dental colleges, I am greatly in

their favor, provided they are conducted by competent men, and limit themselves to the kind of service they are capable of rendering and which legitimately belongs to them.

It is evident that this idea of relegating what pertains to medicine in the curriculum of a dental college to medical schools is rapidly making its way. Already two dental schools have been established as departments of universities, their students being instructed in general medicine in the medical departments of these institutions. To what extent they are able to avail themselves of any advantages this arrangement may offer I do not yet know, but propose to ascertain. I have already referred to the character of the relations of the dental school of Harvard to the medical school as it appeared at the time these articles were partly written, and expressed the opinion, based upon a careful reading of the "Announcement" and "Order of Lectures," that the medical teaching to the dental student must necessarily be very defective and objectionable, as in the short time of a winter session of four months he could not attend regularly any single course of lectures in the medical school. But since that time the Harvard school has made a further advance. It has extended the full course to two collegiate years, and, what is of equal if not greater importance, it has made the course progressive.

But it is said that all this extended course of instruction, not having any apparent practical value, is unnecessary, and for that reason objectionable. But the practical bearing of scientific principles applied to any pursuit, although not apparent to the uninstructed man, becomes obvious at every upward step he endeavors to take. This being the case, the questions involved are not to be considered with reference to individual views or circumstances. They are concerned with the highest interests of the dental profession and the public in relation to dentistry. How to fit men most thoroughly for this pursuit is the most important question.

It has been proposed to induce medical schools to establish a dental course of instruction in connection with their regular course. I can see but one way in which anything of this kind could be done with advantage, and that would be for the benefit of medical rather than dental students. To medical men some accurate knowledge of diseases of the teeth, of which they are now surprisingly ignorant, would be of incalculable advantage. Especially would this be the case in our sparsely-settled country communities. The unnecessary suffering and serious injury to which people are subject who cannot get access to a competent dentist are very great, and very much to be deplored. A little knowledge of the subject on the part of the family physician would frequently be of incalculable service in such cases. And even among practitioners of medicine in large cities some more thorough acquaintance than they now have with diseases of the teeth and their effects would greatly

increase their ability to relieve suffering. A short course of lectures on dental surgery in every medical college, while it would add but little to the burden already imposed upon the regular class, could not but be of great service. This is a subject, however, worthy of greater attention than this mere allusion.

But any attempt by the faculty of a medical school to teach dentistry to dental students, as a part of the regular medical course, is not worthy of a moment's consideration. Dentistry is too broad a specialty to be taught except by those who have closely studied and practiced it, and it would be worse than absurd to attempt to make dentists and physicians at the same time. There is absolutely no royal road to a knowledge of either pursuit. The system of medical education in this country is admitted by the most intelligent physicians to be deplorably inadequate, in the fact that the great range of subjects which it embraces is crowded into one session of four or five months. The first course is frequently, if not generally, entirely beyond the comprehension of the raw student, and with the best capacity and preparation, the knowledge of medicine in all its branches acquired in the two courses, which are a repetition of each other, even when the faculty is capable and faithful, must be superficial. The number of subjects is too great for the grasp of any individual mind, unless years of progressive study are devoted to them. It is idle to think of adding another specialty to a medical course, except in the general way I have suggested.

I can at present see no other course to pursue than that which I have followed with my own students—*i.e.*, to allow the medical course to be pursued fully during the winter without interference, and in the spring and summer to give the necessary instruction in theoretical and practical dentistry. I can see how a dental school might be established on such a plan as this and fully meet the highest requirements of a dental education; that is, let the dental course be not concurrent with the regular winter medical course, but commence in March, when the regular session usually closes, and continue until the following October, with a vacation in midsummer. This is a plan not widely different from that pursued in England, and we find there, whatever may be said of our English friends as operators, intelligent and educated men at least; and I am unable to see any obstacle which it should offer to their becoming, if they are as deficient in this respect as has been alleged, as practically competent as the most ignorant man in the United States or elsewhere.

I have very little respect for the opinions of those who clamor for the dignity of dentistry, claiming for it an entirely independent position, and at the same time favoring a course which is a bar to its highest development. To say that it is a specialty of medicine does not render it in any degree subordinate or subservient to that pursuit. It only means that a large acquaintance with the scientific principles in-

volved in general medicine, and bearing upon dental surgery, should be studied by those who engage in the pursuit of dentistry. While by no means disposed, in any undue degree, to seek the favorable notice of medical men, I can see no possible reason why we should despise the good opinion of the honorable profession of medicine. If dentists were broadly educated in medicine it would have this advantage, it would bring them into more intimate personal contact with physicians, and would at least enable the latter to comprehend better than they now do what dental surgery means.

However the agitation of this question may affect dental schools for the present, one of the certain results will be the introduction into our profession, through other channels, of a class of more highly-educated men, who will eventually take rank of those of a different stamp, and compel the public to distinguish between the two classes. It will certainly have the tendency of inducing the better members of the dental profession to combine against the establishment by incompetent men of any more dental colleges.

DR. CHUPEIN'S ANSWER TO DR. WEBB.

BY THEODORE F. CHUPEIN, D.D.S., PHILADELPHIA, PA.

It is a settled conviction with all theologians that controversy rarely, if ever, results in conversion. Whatever may be the cause, it is very rarely that we find men changing their opinions as the result of controversy. There is, nevertheless, this benefit to be derived from discussion: it brings out the salient points of each side, and thus serves others if not the contestants. That those who read these articles may derive some benefit therefrom is our wish and hope, and so we again don the armor in defense of what we sincerely believe to be right, respecting, however, our opponent's opinion, as we would have him respect ours.

Dr. Webb asserts that the juxtaposition of gold with gold, in the case of two teeth filled on the proximate surfaces next each other, in the manner he operates,—viz., contour filling,—is superior to enamel next to enamel in a similar position; in other words, that teeth filled by the contour plan are rendered in a better condition than before they were decayed at all, and his reason is, because "this very freedom of the margins of enamel enables the oral fluids (kept in almost constant motion by the action of the tongue, lips, and cheek) to keep these margins quite clean, even without the use of the brush, floss-silk, and tooth pick." Further on, Dr. Webb says, "disintegration of the enamel may be prevented by polishing the proximate surfaces of the teeth frequently, and by having the patient pass floss-silk or use the tooth-pick daily

between them." Therefore Dr. Webb states that teeth that are intact *may* be kept intact by frequent polishing of the proximate surface and the daily use of floss-silk and the tooth-pick passed between them; but teeth that are decayed and filled on the proximate surfaces by the contour plan, in such a thorough manner as he is able to do it, *will not* decay, "even without the use of the brush, floss-silk, and tooth-pick." This is such a very broad assertion that we fear we can make none, concerning our mode of operating (self-cleansing spaces), that will stand against it. We propose to do all that man can do to aid nature; but to make art superior to nature? Why is it that the oral fluids are kept in constant motion by "the action of the tongue, lips, and cheek," thereby preventing decay *after* operations of this kind are performed, and not *before*? Does the presence of such fillings in the mouth exert any motive-power on these fluids, or on the tongue, lips, and cheek, to cause a greater flow or more increased action, whereby these margins of the plug and tooth-substance are kept quite clean, "even without the use of brush, floss-silk, and tooth-pick," *after* these operations, when they were unable to do this *before*? The doctor has it within his power to make a convert of us to his system if he can satisfactorily prove this assertion. He says, further, "It is certain that when enamel comes in contact with enamel disintegration of this enamel does take place, and, as stated in the paper (Dr. Webb's paper), almost invariably at or *about* the point of contact.* I am equally certain that when gold comes in contact with gold, and the operation has been very thoroughly, skillfully, and artistically performed, and the parts finely finished, caries will very rarely recur, and cannot do so, at the points of contact." That enamel will disintegrate if permitted to come in contact with enamel is what we know, if these contiguous points are not kept free from the accumulation of food, for which reason we advocate the permanent separation system, whereby it is prevented from close contact. That when the two points of contact are of gold, as in contour filling, they cannot decay *at* this point, since gold is incorruptible, we also know; but that caries will "very rarely recur" at the juncture of the gold and tooth-substance is what we very much doubt; hence our opposition to that style of filling which puts this point of juncture out of sight. We are sensible of our deficiencies, and, like Dr. Webb, we seek at every new effort to improve on the last, and it may be that to this cause our ill success in this style of work is attributable; yet, on the other hand, when we know men of superior qualifications and artistic taste and skill pursuing that style of work (*viz.*, the Arthur system)

* By reference to our "remarks" at page 239, it will be seen that we are inclined to believe that teeth do not commence to decay at the points of contact.
—T. F. C.

which experience—not the desire to run in *ruts*—proves to their mind is the best for the good of their patients, who come to them with full confidence that they will be fairly, honestly, and skillfully dealt with, then we say to ourselves, “It cannot be the natural stupidity of the brute,” as we were inclined to think, from our failure, “but from the incorrectness of the principle.” Certain it is, however, we have found that we have been enabled to save more teeth by the permanent separation process than by the other (contour); and as the salvation of the natural teeth is the aim of dentistry,—we may say, the mission of dentistry,—without reference to pecuniary reward, it behooves us to do this, for those who put themselves in our care with full confidence in our integrity, by that process which in our honest opinion offers the greatest certainty or the greatest chance of success.

The doctor does not consider it worth while to take into consideration those fillings that “wear flat.” If any one will take the trouble to examine the proximate surfaces of the teeth—especially the bicuspid and molars—from any adult skull of twenty-five or thirty years of age, he will find that the enamel on each contiguous tooth on these surfaces has been subjected to considerable attrition,—whether the term “gomphosis articulation” be incorrectly used or not, we will not undertake to argue. Now, when we reflect that this wearing has been effected in from twelve to fifteen years, on material as hard as enamel, with a point of contact as minute as it is in nature, no greater than between two billiard-balls put in apposition, is it unreasonable to suppose that the same cause would exhibit a wearing very many times as great in a substance as soft as pure gold, which, we think, metallurgists tell us is but little harder than lead? And when we further consider the exceeding difficulty of making these convex gold fillings so semi-spherical as to offer but a minute point of contact, is it not fair to presume that this wearing of the gold will advance faster and faster as these points of contact get larger and larger, and by this wearing bring those parts of the filling (*viz.*, the juncture of the gold and tooth-substance) in close contact which it was the chief aim of the operator (by the contour plan) to keep separated? Is the inference far-fetched or unreasonable?

If those who are opposed to the permanent separation system will take the trouble to observe, they will find that teeth do not decay at the point of contact, but somewhere about it. Teeth rarely decay at their necks, except where these are very broad and but little removed from touching their neighbors; or if found decayed at their necks, it was not at this point that decay started, but had encroached on this from some other starting-point. Dr. Arthur’s system, if we understand it correctly, is, *not* to disturb the natural point of contact, if it can possibly be avoided, to make an artificial one; therefore, when

these permanent artificial separations are made, and particularly as advised by Dr. Arthur when decay exists in its incipency, the relative position of the teeth is not disturbed at all, and only those portions of contiguous teeth are separated which do not lie in contact, but are in such close contiguity as to hold particles of food which putresce, which putrescence starts or induces or breeds decay.

We believe that should minute particles of food be forced by the act of mastication between the teeth *at the point of contact*, the motion of the teeth in their sockets would so pulverize, grind, and reduce these particles, so lodged, that they could not remain there long, but would be voided either in the act of deglutition of the saliva or the expectoration thereof. Therefore, when Dr. Webb says, "Philosophy would teach that, no matter what system," etc., page 343, we think he misunderstands the system, for it is not the idea to disturb or separate the teeth in their relative position to each other,—not to disturb that point of contact which never can be restored by Art so well or so minutely as by Nature,—but only to separate those contiguous parts which experience has shown will ultimately decay if left in such close proximity as we find them. Dr. Webb will admit that an isolated tooth rarely decays? And why? Because it is freely washed on all its surfaces, and food cannot collect about it or remain in contact with it, and this is observed to be the case whether the tooth be covered or deprived of its natural covering, the enamel. It is acting on the teaching of this experience that the Arthur system is advanced, viz., that by so separating each tooth as to cause it to touch its neighbor only at a minute point, every surface is kept clean by the united action of the oral fluids, the tongue, the lips, and the cheeks.

Dr. Webb calls attention to the "watchfulness of the most rigid character" advised by Dr. Arthur.

Now, so well satisfied are we of the correctness of this principle, that we should feel satisfied of success with the surfaces that are left on the teeth, by the corundum disks operated by the dental engine, without other subsequent polishing. We would not recommend this, nor is it our habit to leave these without subsequent polishing, but *we have done it*, and done it *with success*, which to our mind only goes still further to prove the correctness of the principle. Many, if not all, parents know how difficult it is to make children, boys especially, clean their teeth, and yet with all the disadvantages of carelessness of children, we can recall very many operations of this style, for children whose teeth were very prone to decay, that were entirely successful. We well remember seeing, before the advent of burring engines or corundum disks, when those who labored at this same principle had naught else but the file to work with, the ridges left by the separating file, plainly discernible to the naked eye, with not so much as an attempt

made to procure a smooth or polished surface; and yet these teeth so indifferently operated on were perfectly preserved.

Dr. Webb contends that the preservation of the teeth by the contour plan demands the nicest work, the most consummate skill, and the most artistic finish, and that anything short of these will fail to secure this most important end. Is it his desire to limit successful dental operations to the few whom *he* thinks possessed of this high order of talent? Is it his desire to complicate the operation of filling teeth instead of endeavoring to simplify it, so that only the *few* instead of the *many* may be benefited?

The aim of all science and art is simplicity, and Dr. Arthur's system has pointed to this end. If to fill a tooth by the contour plan requires the consummate skill and high order of talent he claims as necessary for its accomplishment, then it necessarily follows that the large masses will be debarred its benefits, and only the few who are able to *pay* will be able to receive them. For as contour operations require the expenditure of time, expensive materials, and a high order of talent, it follows, as these are always equivalent to money and are always in demand, that the masses could not afford to pay for them. Far be it from us to lead any one astray, or to indicate in the slightest manner that we approve of or would countenance operations carelessly performed, yet we contend that if the many can perform successfully operations which do not call for that high order of talent, and do this with comfort to their patients, and at less cost than these necessarily expensive operations entail, that system is to be preferred to the other. "Ye have the poor always with you," and are these to be debarred those necessities and comforts which it would appear only the wealthy can enjoy by the pursuit of the other system?

There is a fascination about contour filling that few can resist. To restore those beautiful lines and forms is an innate pleasure to all who can appreciate the beauties of nature or the imitations of art. But it is not our own personal vanity, our likes, whims, or fancies that should be our guide. "What is best for our patient" is a better motto than "What to our eye is beautiful." Every true surgeon would prefer to save the limb rather than to amputate, but every true surgeon decides to the abnegation of all personal prejudices. We are aware that the "contourists" have an almost invincible argument when they say, "We should not remove the natural covering of the teeth, we should conform in our efforts at restoration to the types that nature has set for us; by acting thus we avoid that impacting of food which (they say) is unavoidable by the other method." We say these are powerful arguments against the other system, but while Galileo was forced to deny his theory of the earth's motion, he said, in an undertone, "It does move nevertheless." The propriety of mutilating the

forms of the teeth and the removal of a part of the enamel thereof are difficult points to make clear or reconcile to the comprehension of the bulk of the community we have to work for, and yet the preservation of the tooth by isolation proves the one, and the wearing of the enamel by the attrition of mastication proves the other, to be correct.

Dr. Webb says, "I did not 'hold as necessary' for the preservation of the teeth operated on," etc.,—see pages 343 and 344,—"I stated that disintegration of the enamel may be prevented by polishing," etc.

Mark, "may be prevented." Then we must conclude that even with this precaution, when the teeth are intact, *it is not certain* that decay will be prevented. Now, we hold that if we could get our patients to do this work faithfully, decay *would* be prevented, and there would be no need for either contour fillings or permanent separation; but the difficulty just here is, to get them to do this, and it is for just this reason that we contend for these self-cleansing spaces, and their efficacy, where patients, from their natural carelessness, neglect, forgetfulness, or desire to avoid trouble, fail to use those means to keep the proximate surfaces of the teeth free of food. Yet Dr. Webb asserts that when teeth have become decayed and are restored to their normal shape by contour fillings they are in a better condition than when they were intact, and require less care to keep them from a recurrence of decay than when they were intact, and that patients feeling how much they had to submit to to have them put in proper condition again are more careful with them, etc. We involuntarily stop to think, "Is this really so?" and wish we could see it, in the admiration *we* have of contour operations, through the doctor's spectacles.

Dr. Webb says that he has met, at different times, last winter in Philadelphia, as also in Lancaster at other times, patients who had had their teeth operated on by the permanent separation system; "and notwithstanding these operations were executed by the best operators who practiced this system," says he, "I *know* that many of their patients *curse* the operator whenever mastication is attempted." Well, this is strange. We have made it our business, as we said before, to make inquiry of our patients on this point, and few, very few, complain. My daughter, aged thirteen, has teeth which are excessively liable to decay. I had to be exceedingly watchful of them from the time of the eruption of the sixth-year molar. From the first molar on one side of the upper jaw to the corresponding tooth on the other side all have been separated as advised by the Arthur system. I have the child daily at the table, and have frequently asked her if she experiences any annoyance by food lodging between her teeth, or getting jammed up against the gums so as to annoy her so much as to give her no peace until she removed it, and she has answered, "Never."

Does not Dr. Webb know that it is the habit of all, or nearly all,

patients to complain or find fault with one operator whom they leave to seek the services of another? How does Dr. Webb know but that some of this kind might have cursed, or almost cursed, him when they found that although having submitted to a tedious operation, and paid for a necessarily expensive one of the style he does, after all the discomfort attendant on such, decay has recurred at the juncture of the gold with the tooth, and the whole operation has to be re-performed? Shakspeare says, "He who steals my purse steals trash," etc. But the majority of humanity say, "Touch my pocket, touch my life."

Besides, the operators by the contour plan *have not had time* to test their system, while the Arthur system was tested for many, many years before it was promulgated.

We will admit what he says to be correct relative to this style of operation as performed many years ago, viz., that in consequence of the lack of appliances they could not be as well performed *then* as *now*, yet the rubber dam,—that one great indispensable—that one appliance sooner than be without which we would resign all the great appliances of modern dentistry, sooner than be without which we would almost abandon dentistry itself,—this "sheet-anchor" of dentistry has been in use now nearly if not over ten years, and can Dr. Webb show as many cases of preservation by the contour plan, done by operators whom *he* considers capable, as can be shown him by tyros in the profession by the Arthur system? Again, see the difficulty of ascertaining whether decay has recurred or not. The point of juncture of gold and tooth-substance being out of sight, it would be necessary to wedge these teeth apart to have ocular demonstration of the fact, while by the permanent separation process all the parts are distinctly visible, and the patient would not have to be subjected to the discomfort of wedging merely for an examination. What would be thought of a civil engineer who would advise the boarding up of a railroad trestle for the sake of beautifying the same or of concealing the unsightly timbers, so that, no watch being kept on the work, rot and decay could set in unobserved, and hundreds of lives possibly be lost because the mischief was not repaired in time, and all this for the sake of appearances?

We come now to Dr. Webb's problem, which we will endeavor to solve. He says, "During the last four years," etc., page 345, as far as "golden rule." We think it would have been just as easy to have supplied or supposed worthy motives as unworthy ones. In the cases cited by Dr. Webb, where a number of dentists had requested him to perform contour operations for them instead of their going to some dentist who held the same views as themselves and operated on the permanent separation system, instead of attributing to them such motives as he does, viz., that they felt that contour operations were better than the permanent separation system, might they not have been

actuated by the purest and highest motives in this matter, saying to themselves, "We will take this physic ourselves, and if after a fair trial we find it good for us, we will then give it or recommend it to our patients"? It seems to us this would be a generous view of the subject, and would not require the assumption that they had forgotten the golden rule.

We believe that the rapid advance in the character of dental operations is mainly, or is to a very great measure, due to the discovery of the cohesive property of gold and the use of the rubber dam. And why? because they simplify the operation. Dr. Arthur in giving his discovery of the one and in promulgating his system of prevention of decay by the permanent separation system has endeavored to aim at this. Then why accept one which is acknowledged as simplifying operations and reject the other which time has proved available?

Do you ask us which kind of operation we would prefer? We answer without hesitation, "contour"; but if you ask us which we think best, regardless of our own whims, tastes, or pleasure, we answer Dr. Arthur's system, for in this we consider we consult our patients' interest and welfare.

We would have it clearly understood that, though we have taken issue with contour filling in the main, we are not opposed to it *in toto*. To admit this would be to acknowledge a hobby, which we do not indulge in. There are certain cases, as, for instance, an isolated tooth, where the restoration of contour, supplying a large chewing surface, would be of great benefit to the patient. In such, and perhaps in some few other cases, which do not now occur to us, contour filling would serve a valuable purpose; but in the long run we are opposed to it, for the reasons given in this and our previous article.

We will say nothing on the subject of "Experience vs. Quick Observation." The position taken is so opposed to all teaching that we regard the tirade against Experience as only a pretty piece of rhetorical flourish.

In conclusion, we will say that there seems to be inconsistency in the conclusions of Dr. Webb when he states that the inference we draw relative to the case cited, of the re-performance of an operation done by Dr. Evans, was "unwarranted, ungenerous, unjust, and unkind." How could we be thus accused when Dr. Webb prefaces his article by saying, "I desire to reply as kindly as he criticised me"?

RESETTING AND TRANSPLANTING TEETH.

BY H. N. WADSWORTH, D.D.S., WASHINGTON, D. C.

HUNDREDS and thousands of patients of intelligent, discriminating, appreciative minds and plethoric purses, who would gratefully accept almost any alternative rather than resort to an artificial tooth, are yet

doomed to do so in cases quite unnecessary because unaware of a remedy; because many of us as a profession have not yet seized hold of and applied a principle that nature is constantly illustrating for us, that every little while the country clown is practically and successfully applying for our imitation.

Look back on any of our mental records, and call to mind the number of teeth and roots that have lost their original position; that are at the time we remove them entirely changed from their original location; that are to all intents and purposes dead internally and externally, nerves and blood-vessels, some even lying at right angles with their former position, *i.e.* flat on the gum, and yet, when we examine them, evincing a remarkable evidence of healthy action, and requiring a considerable amount of lancing to free them from their attachment to the gum, and of force to remove them.

We see a country clown who has received a kick from a horse or mule, a blow from any of the thousand and one sources from which they may emanate, and a front tooth is knocked out. It is picked up, pushed into its place, and with no attention whatever returns to its duty and becomes a valuable and useful member.

With these useful practical hints of what nature is doing to correct the ravages of disease, of what uneducated boors can do to remedy the disfiguring results of a painful accident, what are *we* doing as an educated body of scientific men to meet these forlorn-hopes in our practice? in applying these principles that nature on the one hand and ignorance on the other have thrust before us, to awaken our dormant ideas and shame our boasted skill as professional men?

Alveolar abscess of the four inferior incisors, engendered by calculus and allowed to run its destructive course, is one of the crying evils of our profession; one of the most difficult diseases to contend against; one the least skillfully handled, receiving the least attention and resulting in the most unfortunate deprivation that can occur from the simple loss of one or more teeth. Unfortunately, the hurried, inefficient manner in which the first symptoms are treated by many in our profession, added to the difficulty of impressing on our patients the necessity of repeated and constant care, not only on their part, but also on the part of their operator, allows the disease to acquire such headway as to render all the usual remedies unavailing, and a loss of these teeth, one, two, or all, an inevitable necessity.

Having arrived at that condition of disease when no efforts of skill will restore a tooth to a healthy condition, we proceed in the first place to destroy (if alive) the nerve and to remove it, filling afterwards with gold. In most cases of abscess the nerve will be found already dead, and no particular trouble will be necessary in approaching and removing it. This we consider a necessary preliminary step, otherwise the sul-

phur evolved by decomposition of the nerve will permeate the tubuli of the bone, depositing its darkening, discoloring product under the enamel, giving rise to the opaque, disfiguring expression so disagreeable and so objectionable. This entire operation should be done previous to extraction, as the less the tooth is handled before being replaced the more probability of a successful result.

Having brought the tooth into as healthy condition internally as can be done, we arrive at the time for its extraction, previous to which we should make suitable arrangements for securing it *firmly* in position for a sufficient length of time to enable it to become once more solidly established in its former position; for this purpose, with a piece of the usual sheet gutta-percha of double thickness, fit a cap accurately over the offending tooth, and over one, two, or three on each side of it, as may appear necessary, so as to give the splint a firm and unyielding basis to prevent any possibility of a movement of the tooth after it is replaced, and that it may be forced firmly into and be steadily retained in its socket. This retaining of the tooth *in absolute repose* is of the utmost consequence,—quite as much so as the retention of any broken bone that it may “knit,” and if not carefully and thoroughly insisted upon the whole process will probably result in a failure. That the cap or splint may have sufficient durability, it is a good plan to add a narrow strip along its cutting edge to insure its withstanding the antagonizing action of mastication.

Having completed the preliminary arrangements, extract the tooth; carefully and gently remove all traces of the abscess sac, if one existed, and all calculi, but do not touch or remove any healthy periosteum that may perhaps still exist, for in this healthy portion left we hope exists a nucleus for more and for a healthy returned vitality. The disease and the cause of the disease having been removed, we may fairly anticipate a return to comparative health and a considerable amount of comfort and usefulness.

The tooth being prepared with all the rapidity possible, take an instrument and fix a cone of soft Japanese paper on the end, with which carefully and gently wipe out the socket, to remove any fibers of the abscess sac that may remain; wash out the socket by injections of warm water; then press the tooth (after rinsing it in warm water) firmly into its former position, holding it for a few moments with the fingers, and rinsing the mouth until the blood has nearly ceased to flow; then carefully adjust the cap or splint, which a skillful operator can adjust so as to be a tight, snug fit, and holding firmly to its position without danger of coming off or loosening.

It is a good plan to let the patient wear this splint for two or three days (before extraction of the tooth), seeing it daily, and trimming the edges so as to have it free from any irritation to the gum before actual

application to the reset tooth. A wash should be used three or four times daily and the mouth kept thoroughly clean with the brush, but on no account should the splint be removed or disturbed for at least ten days; then its removal for the purpose of an examination should be carefully done as follows: with a sharp knife cut a flap from the edge of the gutta-percha splint down on each side of the tooth to the gum; bend this flap over and away from the tooth, so as to entirely loosen it from its embrace around the tooth; if this does not entirely loosen it from its hold of the tooth, cut a similar flap from the inside of the splint and turn that down also, but do not in either case break the flap off; this will relieve the weak tooth from any danger of disturbance in removing the splint, which can now be done, and the tooth examined thoroughly, cleansed, and gently brushed. If not sufficiently "set," thoroughly dry the splint, carefully warm the flap or flaps, and gently attach them, and whilst warm readjust the splint and carefully press the warm flaps gently around the tooth and leave it a week longer, and then examine it again. If not fully set, try another week, when it will be found a success, probably, if it is destined to succeed. For a wash, use—

R.—Tinct. myrrhæ, ℥ii;
 Oleum gaultheriæ, ℥i;
 Tinct. arnicæ, ℥i;
 Acid. carbolicæ, gtt. xxx.

With this wash use a small quantity in water; let the patient cleanse the mouth frequently each day.

Put the patient on a nutritious but *unstimulating* diet; forbid positively all alcoholic stimulants of any kind, even beer; and last, but not least, tell the patient if your rules and directions are not zealously carried out not to hope for success, for a tooth in this condition is in the last stage, as one might say, of "typhoid fever," in which the chances are against recovery, unless under the most skillful nursing and the high courage of the patient.

Having disposed of one branch of our subject, we come to another and much more difficult one, requiring a much higher order of talent for success, the utmost skill and watchfulness in its manipulations, and far greater honor and reward in its success. Let us examine and inquire into the peculiar surroundings of "transplanting." First, what are the essentials of success? In the vegetable kingdom, in selecting a tree we choose a *young* and healthy one. We remove it from its location with the utmost care, deprive it of a good portion of its foliage, endeavor to save as many of its roots as possible uninjured, and those that are injured trim smooth with a sharp knife; the hole for its new position is large and roomy, the soil rich and loose, and nearly similar to that it occupied before; it is planted with the greatest care, watered frequently, tied up, and kept from moving about; the

time of the day and time of the year are studied and carefully observed, and regulate the operation; and thus skillfully performed it is successful, if a thorough attention is extended to it for some time afterwards.

In choosing a tooth for transplanting, it should be from the mouth of a young and healthy person,—thoroughly healthy, lest we transplant also a dangerous subtle disease,—of the same temperament, if possible; of smaller organization physically, that as far as possible we may avoid having to reduce the size or change the shape of the tooth to have it fit. I look upon any cutting, or even scratching or bruising, as so many wounds to injure and render less certain the result; and every portion of periosteum remaining on the tooth should be carefully encouraged to remain, as it is of vital importance.

Having chosen the tooth we think corresponds in size, color, location, and all the other surrounding characteristics, to replace the one we intend to extract, we carefully kill (if alive) the nerve and remove it, filling thoroughly to the apex, and completing the operation thoroughly. The tooth now being ready for removal, we proceed to prepare a gutta-percha splint, as described before; only, after it has become set and cold, we cut out carefully from the splint where the new tooth is to be located a sufficient amount to give it full room without touching, and this cavity in the splint is to have a small portion of warm gutta-percha put around it as a lining when the new tooth is in position, and the splint is to be carried rapidly to its proper position.

If the new tooth is not accurately calculated to enter the socket of the old one, it will be necessary to reduce it so as to have as good a "fit" as possible, and every requisite to a rapid and skillful reduction of size should be at hand. A pair of callipers will be found useful in gauging its diameter, whilst the length can be easily adjusted by the old tooth placed by its side.

If not absolutely necessary, I would not change the external surface of the tooth in any particular whatever. I would not wipe a drop of blood from its surface, but *instantly* insert it in its new location and at once apply the splint after the blood has ceased to flow.

All simple wounds heal by first intention, if the air is not allowed to enter and cause oxidation. Make a cut in your hand and instantly press the lips of the wound together, holding them under water till a bandage is prepared; then placing a wet cloth over the wound, bind it with the lips firmly together; keep the cloth wet and the cut will close in an hour, and there will be no suppuration afterwards. Now it is equally important that we should transfer the new tooth instantly to its new location, if its size will admit, not changing it in any particular, or even washing it; the chances of success are far greater. If, however, it requires "trimming," then do it as quickly and carefully as possible, and

insert it; and having washed off the blood with the mixture of the formula previously given, apply the splint.

It is still more necessary to keep the patient under unstimulating diet in these cases than in those of resetting, and it is well worth our utmost efforts to let no step be untaken to insure success. The removal of the splint after ten days should be done in the most delicate manner, as described before, and after washing the parts warm the flaps, carefully carry the splint to its proper position, and press the flaps nicely around the tooth and fasten them.

While it is always best to have a sound and healthy tooth for our purpose, one that has lost its vitality without loss of color, or even one that has had no abscess, but is decayed, can be used with success, provided the decay does not disfigure, the periosteum is healthy, and the color uninjured.

RADICAL TREATMENT OF ALVEOLAR ABSCESS.

BY J. N. FARRAR, M.D., D.D.S., BROOKLYN.

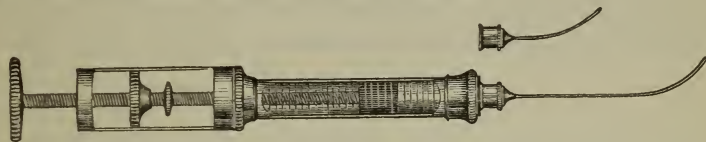
WHILE alveolar abscesses connected with teeth that have single roots are comparatively easy to treat, those connected with the bicuspid and molar teeth are exceedingly difficult. In many instances it was formerly impossible to cure them short of the extraction of the offending tooth.

The general rule of treatment of the posterior teeth on this account has been simply to clean out the roots and fill them with some material and trust to nature for the healing of the abscess, a method called the "absolute cleanliness plan," but in fact only relatively so, but considerably practiced by some dentists with *all* teeth. While comparatively recent cases will sometimes cure themselves after this plan of operation, the frequent failure of older and long-standing cases must be apparent to all, showing that a more thorough treatment is absolutely necessary to satisfactory success. Chronic abscesses under the most favorable circumstances, in regard to youth and general good health, will sometimes continue to discharge after the "absolutely clean plan" as long as the diseased tooth remains, unless radically treated.

This treatment may in some teeth be performed after the old plan of pumping the drug through the roots of single teeth, either by a broach with cotton around it, acting as a piston, or by a syringe. The ordinary hypodermic syringe has been used to a limited extent for this purpose; but owing to the drug so acting upon the piston packing as to harden it, the working of the syringe is made very difficult, so that if the nozzle does not so firmly impinge against some tissue that the drug will not pass through it at all, the jar and violence necessary to force the piston along the barrel causes oftentimes great pain to the patient, who protests against such "barbarous treatment" both in the

office and at home; so that even if the disease is successfully cured the dentist "is cursed with faint praise."

To overcome these difficulties, I made, a year or two ago, an improvement upon the ordinary dental syringe, and have had it in daily use ever since, enabling me to meet with very great success in all cases, even when the fistula opens posteriorly and in the back part of the mouth. At the request of several dentists who appreciate its value, I will here explain the mechanism of the instrument for the benefit of any of the profession who may desire to know.



The above cut illustrates my improved abscess syringe, charged about half full of liquid ready for use. I generally use creasote or aromatic sulphuric acid. Its simplicity recommends itself. This improvement enables the operator to easily reach any abscess through the fistula *in any part of the mouth*. It is so constructed with a *thumb-screw* as to enable the dentist to operate it without causing pain to the patient. It furnishes the operator with a *ready and time-saving instrument*, not only for this purpose but for washing out cavities in teeth before plugging. By a short experience with it any abscess may be treated by it within two minutes, and any cavity can be injected or washed with creasote within two to five seconds. The syringe requiring to be charged only once in a week offers a ready instrument at any moment, and as it is free from leakage it can be placed in the drawer or tray as soon as used. Any abscess which can be practicably reached with a broach and cotton by the pumping plan can be injected with the syringe through the root.

The syringe is nickel-plated, with a very small *gold* tube and nozzle, capable of being bent to reach any point. (Of course it is not prudent to change the curve many times, as it may break.) This tube is about two inches long. Within the metallic barrel is a glass tube gauged by drop marks, which may be seen through a slot made in the outer barrel. In this glass tube the piston plays the same as in the ordinary hypodermic syringe. Over the handle or thumb-end of the piston-rod is a metallic frame-work screwed upon the syringe head. Through the end of this frame passes a thumb-screw (as shown in the cut), which is so arranged that when turned it forces the piston down the barrel, injecting about one drop of liquid through the nozzle for every revolution of the thumb-screw.

My method of operation is to introduce the tube through the fistula or up the pulp-canal of a tooth, and when in position the assistant turns

with great care the thumb-screw (causing no pain) until the liquid flows out around the tube. To prevent the drug's escaping into the mouth, a small napkin should be wrapped around the tube and outlet of the fistula.

To charge, remove the thumb-screw and frame, and proceed as with an ordinary syringe. When loaded (better only half filled), replace the thumb-screw, and if any air-bubble is present elevate the nozzle and force it out; then the syringe is ready for use. As aromatic sulphuric acid will destroy the leather packing, that drug should not be allowed to remain in the syringe. Excepting the engine and dam, there is no one instrument now in use in our profession that is so useful to me.

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society held at the residence of Dr. C. D. Cook, No. 133 Pacific Street, Brooklyn, on Tuesday evening, April 18th, 1876.

President A. L. Northrop in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. C. E. Francis presented a corrugated soft rubber disk, for carrying powder of any kind for polishing teeth and fillings, and recommended that powder used on the disks be mixed with glycerin and pulverized borax, not only for assisting in cleaning the teeth, but for the beneficial effects upon the gums.

Dr. A. H. Brockway. Dr. A. M. Holmes sent me a few corrugated hard leather disks for the same purpose, and I think they have an advantage over rubber, in that they hold the powder better. They are made by turning sole-leather down thin, so that it is very flexible, and while it is dry it is quite as stiff as the rubber disk.

I have here a disk-carrier handed to me by Mr. E. T. Starr, with a request that I present it in Brooklyn. It is a simple and ingenious contrivance for holding the disk at any angle.

Dr. B. also presented a ribbon of steel, rolled so thin that it could be cut with an ordinary pair of scissors, and claimed for it an advantage over any other flexible material for polishing between the teeth, and that it was particularly applicable in applying the rubber dam where the teeth are tight together and the edges sharp and ragged. It was manufactured by L. H. Keller, 64 Nassau Street, New York.

Dr. C. E. Francis. There is a great objection to leather disks on account of having to use a new one every time. They may be washed,

but some persons would object to that. These of rubber are very cleanly.

Dr. W. S. Elliott presented some drills for the engine, appearing like a bur with four cutting teeth, and called quadrilateral drills; asserting that the chisel drill is objectionable from the fact that it is very apt to catch in a cavity, causing much pain to the patient.

Dr. E. also presented an articulator, having the advantage of being easily adjustable to all cases, almost self-adjusting.

Also, a universal impression cup, of britannia ware, being applicable for impressions for either a full or a partial set, a wide or narrow jaw, and which can be made cheap enough to allow a dentist to use a new one every time.

Dr. E. A. Bogue. Dr. Williams, of Boston, sent me two or three little gold toad-stools, in shape, requesting that I exhibit them. I have not got them with me. They are the device of Dr. Fisk, I think, of Massachusetts, who has used them by filling teeth with gutta-percha, then warming this gold, and pressing it home. The gold is somewhat the shape of an umbrella, the tent of the umbrella being shaped as the surface of a large gold filling would be; so that you have a gutta-percha filling and the gold cap as a protection to the gutta-percha. I have seen some such fillings that have been in a great while, and they seemed to be doing well.

Dr. C. E. Francis. In the routine of office practice our attention is frequently directed to teeth the crowns of which are badly broken and almost or wholly unfit for further service, but which can be ill spared by their possessors. The loss of each masticator imposes extra labor upon its remaining fellows, frequently causing them to break or rapidly wear away, and sometimes to become forced out of regular position, or loosen and become quite exfoliated. In the mouth of the adult it seems particularly desirable that every tooth which can be rendered useful be retained as long as possible, thus avoiding the resort to artificial substitutes, which at best are but poor representatives of good working sets of natural dentures. It is the dentist's duty to save these useful organs of mastication, and every method that ingenuity and skill can devise should be brought into requisition for this purpose. From accident or long neglect, crowns of teeth break away. Sometimes fillings are undermined with decay and give out, leaving walls too frail to clasp and retain new fillings, yet such teeth are really needed and perhaps sadly missed if utterly lost.

We have long been in the habit of pivoting artificial crowns to roots of superior incisors and cuspidati, and occasionally have tried to secure them to the roots of bicuspidi; not often, however, with any great degree of success with the last named class of teeth.

But have the molars got so badly fractured that they cannot be

filled? These, like the bicuspid, are usually considered worthless, and are either left to decay away or are removed. For each one lost mastication is rendered more difficult.

For many years past I have given much attention to teeth in the condition described, and efforts to repair and render them fit for further usefulness have in very many instances proved far more successful than I could possibly have anticipated. Undoubtedly, others have experimented in the same direction and possibly with similar success, for nothing seems to be new in this world, and original ideas are very few; yet some of the methods I have adopted came to me as original suggestions.

I am told that fragments of broken teeth have been strapped or bolted together, but how, when, by whom, and with what degree of success, I have not yet learned.

My first effort in this direction was to restore a hopeless-looking bicuspid, being prompted by the earnest request of one of our distinguished citizens, who insisted that I must contrive some method whereby his tooth might be saved. This was eighteen or nineteen years ago. All that remained of the crown was a mere section, only part of a cusp, connected with the root by a slender line of partly decalcified tooth-structure, which a slight force would apparently snap asunder. After careful preparation, I made a band or ferrule of gold plate one end of which I fitted to the tooth. Then warming it over the flame of a spirit lamp, I lined the inner surface with Bevins's stopping, and slipped it over the cusp securely to the tooth. I immediately packed the entire space with the stopping, leaving only the extreme point of the cusp visible. Twelve months after, I found the tooth in splendid order, but the stopping had worn away on the surface just enough to leave the inner edge of the band exposed. I removed about one-third of the stopping and refilled with gold. Eight years after, it got accidentally broken; but it was a clean break, no signs of further decay being visible, and it had been a faithful worker during that period.

Since then I have saved a great number of broken teeth in a similar manner, and most of them are doing good service at the present time. In a number of instances I have treated two or three such teeth in a single mouth. Have used gold bands and platina bands, and filled them with gold or amalgam, always, however, first packing Bevins's stopping securely against the roots.

Superior bicuspid, when decayed or filled on both approximal surfaces, are very likely to split between the cusps, especially when the cusps are quite long and particularly well defined. Formerly I secured the parts firmly together by the use of bands and filled with some plastic material. Frequently these fractures will run from between the cusps diagonally to the anterior cervical border, and the buccal portion

will fall off. In such cases it is usually the custom to restore by means of contour filling of gold or other material; but these do not always prove durable, and are otherwise objectionable.

Within the past three or four years I have repaired such cases by attaching a porcelain cusp to the remaining portion of the crown by means of a platina band, in the manner I will describe. Make a cast of the case; select a small-sized plain plate tooth (with "cross-pins," if possible), and grind to fit the cast. Take a strip of platina plate of thickness No. 31, about one-quarter of an inch wide, and of sufficient length. Punch pin-holes in the center, and rivet or solder on the tooth. Bring the two ends together around the model, and solder. Fit as nicely as possible, and slip the band over the remaining cusp in the mouth. Then fill with oxychloride of zinc. At some subsequent sitting remove a portion of the oxychloride of zinc, and cap with gold or any other stopping. Lastly, burnish the edges of the band closely to the enamel.

Dr. E. A. Bogue. Some time since I treated an incisor which had split vertically, leaving the anterior plate of enamel standing by itself and the posterior by itself, as follows: The cavity ran from one approximal surface over the cutting edge to the other approximal surface, and, after trying various means of plastering the tooth together, I at last drilled a hole from front to rear, straight through, and countersunk the hole on the labial side enough to accommodate the screw-head which I proposed to put in. The hole on the lingual side I made conical, and shaped a wooden plug that fitted it exactly. Using a drill the same size as the screw, I drilled a hole into the plug; every turn of the screw drew the two pieces closer together, the countersink in the labial side holding the head of the gold, and the wooden nut upon the lingual side, being conical, tended constantly toward the head of the screw as the screw was turned. I filled the cavity with the oxychloride of zinc. The patient, a physician, was in my chair recently, and spoke of it as being perfectly comfortable.

Dr. C. D. Cook. I would like to ask a question or two as to the cause of death of a pulp in a tooth in which I made a gold filling four years ago. The tooth formerly had a filling of gutta-percha and amalgam over it, and I filled it about two years later with gold; no disturbance whatever during the four years. Ten days ago the patient, a lady (who was formerly a patient of mine, but for the last two or three years has been under the care of Dr. Bronson), came to me suffering severely with pain in this tooth, and had been for a week. I removed the filling, drilled into the pulp-chamber, and within an hour she was entirely relieved, and I have done nothing to the tooth since. Since the filling was put in the tooth the lady has married, and I think is now the mother of two children. This is not the only case of the kind that has

come under my observation. Why, under such circumstances as described, do pulps die?

Dr. W. H. Atkinson. What was the condition of the tooth when you filled with gutta-percha?

Dr. C. D. Cook. Pulp nearly exposed, but do not think it was quite. I drilled three holes into the pulp-chamber, and the last one was near the buccal horn. It was a first right lower molar, the anterior approximal surface. There was no discharge when I drilled in. The pulp was not quite dead then, as there was a little sensation.

Dr. Atkinson. Was there any periostitis?

Dr. Cook. No, not of any consequence.

Dr. Atkinson. Nor sore to the touch?

Dr. Cook. No, I think not.

Dr. W. A. Bronson. The lady that Dr. Cook speaks of came into my hands about a year ago, and I filled the posterior approximal cavity of the tooth. I don't remember that there was any special sensation about it, or anything that led me to notice the condition of the pulp. About a week ago, after Dr. Cook opened the cavity which he speaks of, the patient came over to me again by appointment. I opened the pulp-chamber and found the body of the pulp in the crown of the tooth entirely dead, and supposing that the whole pulp was dead, I used some freedom in the excavation; but I found the pulp entirely alive in the posterior root, and to some extent alive in the anterior root. I did not wish to apply arsenic, and it was so sensitive I could not cut into it. At that time there was no periostitis at all, so I touched it freely with carbolic acid, then put in a little oxychloride. In about fifteen or twenty minutes the tooth began to ache, and I had to remove the fillings that I had put in, and it was about half an hour before I got the patient quiet again. I have no expectation that what remains of the pulp can be saved alive, and have no doubt eventually in my hands it will come to arsenic.

Dr. Cook. Did I do right in cutting into the pulp-chamber?

Dr. C. E. Francis. Did you make any application before you drilled through to see if you could reduce the pain?

Dr. Cook. No, I went by what the "angels" told me.

The President. I would like to inquire of the gentlemen present if they have had any more cases of facial neuralgia without apparent cause, within the last year or six months, than in former years.

Dr. A. C. Hawes. Dead pulps are apparent causes. I would state that I have had a good many more than usual.

Dr. Wm. Jarvie, Jr. I have a distinct recollection of half a dozen cases within the last three months of facial neuralgia, caused by teeth in which the pulps had become inflamed or died without any apparent cause.

The President. I refer particularly to cases in which the pulp has been dead for a long time.

Dr. W. A. Bronson. This case of Dr. Cook's is only one of a great many that I have had within the last two months. I have never had so many in the same length of time. I had one notable case of a young man who came to me about two weeks ago. The tooth, an upper molar, had been filled about four years previously. He said he had been troubled with it a week or two, and the night before had not slept at all. I was busy at the time, and left him for a moment; when I returned to him he said he must be attended to at once, as the pain was intense; so I removed the filling and drilled a long distance before I reached the pulp; when I did reach it there was a very slight discharge of pus, which was followed by a free discharge of blood.

The President. I asked the question because the subject has been before some medical societies, and I have heard a number of physicians speak of it, saying they have had more facial neuralgia in their practice within the last few months than perhaps ever before in the same length of time.

Dr. A. C. Hawes. A gentleman called at my office this morning, having suffered pain in a second superior bicuspid which commenced suddenly about two weeks ago, and for a little time the suffering was very intense; finally it extended to the center of the upper jaw, which became quite benumbed: since that time he has suffered from a sort of facial neuralgia. I could find no indication of decay in any of the teeth in that vicinity, and no appearance that would indicate dead pulp. I tried all the tests I could think of, and could not discover that any tooth was at fault. I think some tooth must have been the cause, and I would like some one to tell me how I may determine. There was no periostitis, no large cavities, no sign of exostosis, and I didn't know that he had been exposed to malaria.

Dr. Wm. Carr. I have found some such cases where there was no apparent cause, and it might have been from living in a malarial region, and malaria lurking in the system. I would ask Dr. Hawes if this patient had lost any teeth?

Dr. A. C. Hawes. No, I believe not. None in that vicinity at all events.

Dr. W. A. Bronson. I believe cases of that kind are very rare where there is not some lesion in the teeth.

Dr. E. A. Bogue. May I repeat the question relative to the experience of gentlemen present in regard to these cases of facial neuralgia. They are greater this spring than ever before, perhaps, but are not such cases more noticeable in the spring than at any other time of the year?

The President. As far as my own practice is concerned, I have

never noticed it in my life so much as this spring. I don't know that I have noticed it in spring rather than at other seasons.

Not long ago a lady came to my office who had an incisor tooth which had been filled before she was nine years of age, and she must be at least twenty now. At two or three offices in New York where she had been recommended by dentists and surgeons, she had been told the trouble she was having was from her imagination, there was nothing the matter with the tooth. She came to my office two or three times, and finally I drilled into the tooth and found a dead pulp. From the usual tests I did not discover anything, but the last time I put a strong reflector at the back of each of the teeth, and found that the color of this one was not as clear as that of the other teeth.

Dr. E. A. Bogue. Last spring, about this time, a lady complained of pain in her right upper wisdom-tooth. After two examinations, in which I told her nothing was the matter, she came again. I drilled into the right cusp, which had been filled four years before, and got out a large amount of pus.

Dr. W. I. Thayer. I would like to say a word or two with regard to the subject presented by Dr. Cook this evening. It would seem almost as though the trouble was simply an inflammation of the pulp, and perhaps pus had formed. I doubt whether anything could be done further than to open the cavity. I had a case a few days ago where another dentist had filled a cavity with a large amalgam filling. The patient came to me suffering from what I supposed to be pulpitis, and I gave him the treatment of which I have spoken in the Brooklyn Society, Mezereum (Spurge Olive). I had never tried it in a case similar to this before. It relieved the pain immediately. There was no peristitis in the tooth, and inflammation had not gone so far as to produce supuration.

Dr. W. H. Atkinson. For the comfort of Dr. Cook, I want to say that he need not feel very much annoyed about this case, if it were handled in such a manner as I think his manipulative ability would lead him to do. I am strongly of the opinion that there are very many pulps that are in this condition from having been converted into various degrees of metamorphosis from the conversion of pabulum into pus and gas. They do not notify the patient of any mischief whatever as long as the constitutional condition is good. But, under malarial influences and other depressing agencies, they often assert their power over the living portion of the pulp, and when they do, the whole matter is attributable to some very old event. I have repeatedly removed fillings and found empty cornuas of pulp-chambers, and could not account for their being so, but upon further examination found that there was a simple recession of the pulp without any information on the part of the patient, or any recollection of any disturbance ever having been there. I have seen

that kind of wasting away, as I say, from just the exposed horns of the pulps, in all stages down to leaving but a mere remnant at the end of the root; so that I would never use arsenic in such a case, and I never would use any escharotic, because I would still hope to conserve whatever vitality there was. Just the nature of the case as referred to is very clear to my mind, and after having it delineated by two so competent witnesses, I should hold myself almost able to decide about the nature of the case, and that it was such a case as we ought to treat mildly. Whether there would be any discharge from the location, as one question was asked, depends very much upon what you mean by a discharge. The probability is that there was in that case, and that it was in consequence of the gas pressing upon the pulp that was the cause of the pain.

With regard to Dr. Hawes's case. Did it not come into your mind that the probability was calcification—a little pulp-stone forming there? If so, that would cause the irritation. I have seen such cases where opening into the pulp-chamber and removing a pulp-stone would relieve the difficulty. In such cases I formerly used arsenic. I would not now.

Dr. A. C. Hawes. How do you determine the character of the trouble?

Dr. W. H. Atkinson. I would do just as you have done. If I did not see exactly what the matter was, I would tell the patient to come again and let me make further examination.

I examined the pulp of an incisor with probably some twenty-five pulp-stones in it, large and small, through the whole length of it, clear to the very end of the root, taken from a tooth extracted by Dr. Wheeler, of Albany. He brought it to New York, and we examined it together under the microscope. The character of the pain in this case was so agonizing that the patient would not hear of any kind of treatment or examination at all, but insisted upon its being taken out. It was taken out and found to be perfectly sound; Dr. W. split it, and found it in this condition. After all, we must sometimes depend upon this kind of inspiration which Dr. Cook speaks of.

Dr. Wm. Carr. If you would not use arsenic, what would you do?

Dr. W. H. Atkinson. I would simply use some soothing agent, and if I found these nodules I would remove them.

Dr. W. I. Thayer. I lost my first molar after it had been filled with gold six years. I never had any trouble with it until five or six years after it was filled, when I had very severe periostitis in it, and I could never solve the mystery. I extracted the tooth myself.

The secretary read the following paper, entitled "An Additional Testimony on the Amalgam Question," by Madame H. Tiburtius Hirschfeld, D.D.S., Berlin, Prussia.

It was with great interest that I read the proceedings of the New

York Odontological Society, published in the DENTAL COSMOS of 1875. Among the different articles for discussion, the one that interested me particularly is entitled "Amalgam Experiments," by Dr. Cutler, of Memphis.

Having received my dental education in the Pennsylvania Dental College, I imbibed nearly all the prejudices against amalgam which were generally entertained at that time by all able men of the profession, scarcely any one having the courage to come forward to acknowledge and defend the good qualities of "*the nasty stuff*." Knowing, however, by personal experience, how useful this much abused material, under certain circumstances, may be,—for I have an inferior molar, half of the crown of which, only, is tooth-substance, the other half, with the buccal surface, having consisted for seventeen years of amalgam,—and knowing, likewise, that many of my patients could not pay for an expensive gold filling, nor stand the insertion of a large one in a second or third molar,—I brought, notwithstanding these prejudices, a considerable quantity of the material with me.

Of the different kinds then in the market I selected "Walker's Excelsior Amalgam," and will briefly state my experience with it, in the three different classes in which I have used it. As it is entirely free from copper, it does not tarnish more than tin-foil, and cannot be distinguished from this material by the eye, but only by scraping it with the excavator.

I have used it with perfect success in molar teeth of strong texture; indeed, with some patients I have built up the whole crown, when there was only a small rim of enamel left and the roots were like funnels. Many dentists would have condemned these ruins for extraction; others, passionate builders of gold crowns, would have persuaded the patients to endure this prolonged operation, and pay for it in proportion. I treated the roots as usual, filled three-quarters of them with cement, then built the whole crown with amalgam. These teeth have been now, for six years, a useful part of the masticating apparatus, without the least change, and are declared by their owners to be their best chewers. These cases were just the kind in which a severe periostitis would have certainly followed the insertion of such a large gold filling, and very likely, also, the loss of the tooth, aside from the hours of torture passed in submitting to the operation. In such cases I claim amalgam to be the most useful article in the hand of an educated and conscientious dentist.

In those soft and chalky teeth with which we so frequently have to deal, I found the fillings soon became defective on account of contraction, even in crown fillings. In the third class of fillings, posterior approximate cavities in the second bicuspid and molars, I found this still more the case, and abandoned the use of it for a long time.

Dr. Cutler's experiments prove evidently, what experience has taught me, that there is no contraction of the copper amalgam; but not knowing then the great advantage of this material in this one respect, and only seeing how black and ugly it looked, I did not think of using it. But when I saw, year after year, country patients and others, some of whom kept their mouths filthy and who had been always in the hands of poor operators; and yet the black amalgam fillings, put in very carelessly and under unfavorable conditions, still remained and preserved the teeth, I could not but become convinced of the good qualities of this material. I first commenced using it with those young ladies who have to earn their own living, and who have generally poor teeth because poorly nourished, and who work in ill-ventilated rooms, and, on account of their limited means, need, more than other persons, to be kept at least free from toothache.

Provided a dentist does not consider himself to be a dentist for the rich only, but tries also to be useful to all his fellow-beings as far as possible, what can he better do for such patients than to select a material that answers all necessary requirements excepting good *color*? For this reason it can only be used in the back part of the mouth. I use it also for patients who, though willing and able to pay, are not able nor willing to stand a large gold filling in a wisdom-tooth, nor a posterior approximate filling in a molar. Also, in cases where there is an excessive flow of saliva and a very small oral cavity. I put these fillings in with the same care as if they were gold, and am convinced I can warrant them to do better under the above-mentioned circumstances, while at the same time they cause much less suffering to the patient.

There is still another class of patients with whom I find amalgam very valuable, but only that which contains a certain proportion of copper,—I mean in approximate cavities of the milk teeth. Having a very extensive practice among the little ones who, by inheritance or for other reasons, present themselves with teeth of the poorest material at the delicate age of three years and upwards, I have from the beginning of my professional career tried my utmost to preserve them until their normal time to disappear has arrived. We all know how easy it is, if we only have to make fillings in the masticating surface, but also how difficult it is to make the fillings stay for any length of time in the approximate cavities. If they are shallow, cement is easily washed out and Hill's stopping worn away; in using tin-foil there is danger of injuring the pulp by preparing the cavity to retain the foil; if they are deep already by decay, the danger is still the same. I can safely say I have been successful in the treatment of children, wherever I have been able to convince the mothers of the importance of preserving these teeth, and of following strictly my advice in order to do this. But even in such cases the approximate fillings have given me a vast amount of

labor without any pecuniary compensation, and other dentists, I know, have had the same experience.

For a year past I have tried amalgam in such cases, and with perfect satisfaction thus far. I hunt for the smallest cavities, fill them very carefully, and have not yet found that they have failed to do their duty, while their painless and easy insertion is a great advantage in treating children. In crown cavities, however, if they are not altogether too large for any metal, I use tin, and lately tin and gold-foil combined, as the best material for soft teeth; this I have also done with grown persons.

Prejudiced in America against such combinations on account of the galvanic action, as well as against the use of any kind of amalgam, I took it up with great hesitation at the suggestion of our highly-esteemed colleague, Dr. Frank P. Abbot, of this city (Berlin), in whose experience, skill, and conscientiousness I have the fullest confidence. To-day I can fully indorse all that Dr. Jenkins, of Dresden, said on the subject in the DENTAL COSMOS, August, 1875, and Dr. Paetsch in the same journal in October, both of whom, like myself and others, are indebted to Dr. Abbot's advice for the introduction of this valuable method in their practice. That some action takes place is clearly proven to my mind by the greater degree of hardness of the filling after a time than directly after its insertion, but none of us have ever found this to have a deleterious effect on the tooth; on the contrary, it seems beneficial to it as well as to the filling.

These frail and chalky teeth we so frequently meet here are often a stumbling-block for the *hot spur* gold-fillers, who come from the United States. They will fill such teeth very perfectly with *gold*, they could not touch anything inferior, and after some time they will see, to their great annoyance, that their splendid work was a failure, where gold and tin would have been a success. I think it makes little difference whether the gold-leaf is laid inside or outside of the tin-foil, as they combine perfectly with each other. Dr. Jenkins prefers to have the gold outside; for me the reverse works better.

I do not wish to be understood as not having the proper appreciation of gold for fillings, but I must plead for the appreciation of other materials likewise, which, under certain circumstances, may be far better than gold. While defending myself, I cannot close this article without defending my countrymen also, against the charge of Dr. Eastlacke, in the DENTAL COSMOS of November, 1874, who, after saying dentistry was not appreciated in Germany, uses these words: "The patients, themselves, are duplicates in stupidity of the Celestials. American prices are considered fabulous." It is true the Germans consider the charges of some American dentists fabulous, but it is not the Germans alone who complain; both resident and traveling Americans insist they never have paid such enormous prices for dental operations at home.

European dentistry is still far behind American. We have received and still receive our best dentists from the American schools; but I would ask a simple question. If the Germans do not appreciate good operations, why is it that so many American dentists live and flourish here; and why do people with limited means try to pay their prices, in order to secure good work, while native dentists, with but few exceptions, have to struggle for a living? I think facts answer better than words.

Dr. E. A. Bogue moved a vote of thanks to Madame Hirschfeld for the paper with which she had favored the society, and in doing so called the attention of those present to the fact that it was the first paper presented before an American dental society written by a woman, and to the fact that it was written in a fair, quiet, dignified manner. Gentlemen might find as much fault as they would with the writer's conclusions, but that the paper embodied the results of careful observation was evident. Unanimously adopted.

Dr. E. A. Bogue inquired whether any one present knew of any advantage resulting from any mixture of gold and tin.

Dr. W. H. Atkinson. I know of no advantage further than the one that is referred to in the paper. Dr. Corydon Palmer, twenty years ago, from motives of economy, was in the habit of laying one or two folds of No. 6 gold-foil immediately against the wall of approximal cavities in incisors and other teeth, and filling them up with tin-foil, allowing the gold to come perfectly to the edge and finish it off; and I have seen such fillings from his hands do good service without discoloration of the teeth.

(To be continued.)

AMERICAN DENTAL ASSOCIATION.—SIXTEENTH ANNUAL SESSION.

(Continued from page 534.)

SECOND DAY—*Morning Session.*

THE subject of Dental Pathology and Surgery was passed, and that of Chemistry called. No reports being ready, the subject was postponed. Therapeutics was called, but Dr. Atkinson, the chairman of the committee, asked for further time, which was granted.

Operative Dentistry was then taken up, and a report was read by Dr. Frank Abbott, of New York, chairman of the committee. The following is a synopsis of the paper, which opened with a reference to the fact that this was the centennial year meeting of this association, in view of which it seemed that a *résumé* of the ideas of the leading minds of the profession during that period would be appropriate. A century ago there were no established dentists here, or none whose ideas have

been transmitted. The first quotation made by the author was from a work of John Hunter, published in London in 1778. After giving his views of the causes and effects, he proceeds to give the remedies for the cure, of the "decay of the teeth arising from rottenness;" and states that though the progress of the disease appears in some cases to be retarded by the removal of the part already decayed, yet there is but little dependence upon the practice. It would, however, prevent any effect which the rotten part might have upon the sounder parts. In many cases it would be impossible, because the decay had made too great progress, or had reached the "cavity" (pulp-chamber); in this latter case he would advise "that the tooth be extracted, and then immediately *boiled* to render it perfectly clean, as well as to destroy any life there might be in it, and then that it be restored to its socket; this will prevent any further decay of the tooth, as it is now dead, and not to be acted upon by any disease, and can only suffer chemically or mechanically." For pain in the tooth he recommended counter-irritation, as burning the ear with a hot iron, or snuffing stimulating medicine up the nose. Stopping the cavity, he says, may prevent the inflammation if resorted to in the early stages of the disease; gold and lead are the metals most employed for the purpose. Stuffing with wax, galbanum, etc., can be of but little service, though these substances have their uses, as the patients themselves can easily put them in place. In cases where so much of the tooth has given way that none of the stoppings would be retained, a small hole may be drilled into the sound portion, and after the tooth has been well stopped, a small peg may be put into the hole so as to keep in the lead, etc. If this cannot be done, the tooth will soon become liable to inflammation, which the patient must either bear or submit to extraction. If the former, a cure will be effected in time by the stump becoming totally dead.

The report then quoted from Fox's work, published in 1806, where it is stated that caries is a disease which it is not in our power to arrest by any remedy whatsoever; and the only plan promising success was to remove the carious part from that which is sound, with the expectation that the disease would be thereby stopped; thus showing that the progress made by the great men of our specialty was very slow. As to stopping the teeth, the latter writer says that in situations in the sides or between the teeth, the pressure of the food is liable to displace the stopping, and it requires frequent renewal. Of instruments he says: "They consist of a hook for picking extraneous substances out of the cavity; a straight and a curved instrument for pushing the stopping into the tooth, and an instrument with a bulbous point, to be used as a burnisher."

The progress of dentistry during the twenty-five years following was very material. It was no longer a question whether teeth could be saved,

but how to accomplish it was the point. Each practitioner had his own method, which he was sure to keep to himself, so that the rank and file were kept in ignorance of the ideas of the men of brains. Writings of these men were better as literary productions than as practical instruction. Journals, however, sprung up, and associations were formed, and slowly but steadily information was diffused. A general exclusiveness was the order of the day, and so continued for many years; the operating-room was a mysterious place, the door of which was kept closed. Liberal-minded men, such as Harris, Townsend, and Parmly, became engaged in the profession, who delighted in imparting information. In 1839 the Baltimore College commenced its labors, the first means afforded in this or any other country for obtaining a systematic education in dentistry, and the real beginning of progress in dental surgery. Without detracting from individual effort, it must be claimed for colleges that the lion's share of credit is due to them.

In 1855, Dr. W. H. Dwinelle published his famous article upon crystal or sponge gold, giving the process for restoring the contour of teeth, which was the beginning of this practice, and was a wonderful step in advance. For want of proper instruments, however, many who had tried these preparations were obliged to abandon them, until, in 1862, Dr. W. H. Atkinson brought out the first set of pluggers adapted to the use of cohesive gold, together with the use of the mallet, the last being one of the longest steps in advance ever taken by any one. With it, in connection with the rubber dam, which was given to the profession in 1865 by Dr. S. C. Barnum, we can restore the crown of a tooth with as much ease as we could formerly fill an ordinary cavity, although previous to the introduction of the dam, crowns were being successfully restored by Drs. Arthur, Dwinelle, and others, with the use of napkins only. With the advantage of these appliances, members of the profession imagined that they could ride at once to fame and wealth; but those who rode the hobby cohesive gold, without being acquainted with it, soon found it a delusion and a snare, for a few months sufficed in many instances to cause a discoloration about the fillings. Many of us have been thus caused to ask whether such a condition was our fault, although assured that the work had been done with care and thoroughness. We have attempted to ride a hobby which requires some study to manage; and many having failed to do so, quietly resume their seat upon "soft foil," remembering at the same time with the kindest feelings those who first discovered and made known the cohesive properties of gold, which they are constantly called upon to use in restoring the crowns of teeth.

The dental engine was the next innovation, and came into market about 1870,—a machine which enables us to excavate much more rapidly and perfectly, and with much less pain to the patient in the aggregate.

Notwithstanding these advantages, it is in the hands of many a dangerous instrument; the tongue may be cut, the cheek torn, and the pulps of teeth exposed. To prevent such accidents a thorough knowledge of the anatomy of the tooth is essential. The paper then considered the question, "What preparation of gold can teeth be best preserved with?" and stated the belief of the writer that the days of heavy cohesive foil for filling teeth are nearly over. The reason why many good dentists are idle much of their time, while others, no better dentists, are always busy, was stated to be that the first class do not study the comfort of their patients, while the latter make it a study. In filling teeth they perform the operation as rapidly as possible, and do it well, working upon a regularly systematized plan, with each instrument adapted to certain localities and operations. They make every move count, do not allow their operations to worry them, never get nervous, and so things move along rapidly and smoothly, time is saved to the patients, which is a great consideration to many, and their sufferings are much less than when the operations are performed in a tedious manner. The man, on the contrary, who has much time on his hands reverses this. He seems to try to see how long he can take to perform his operations; worries an hour to put the dam on a tooth, where the operation might be kept as dry with a napkin and completed in ten minutes. His time is wasted in selecting instruments and in other ways, and at the end of the day he finds that he has accomplished little.

The paper, in closing, referred to the fact that the necessity for a more positive prophylactic treatment of the dental organs is becoming more apparent; and so thoroughly was the writer impressed with this idea that he recommended, in every case he treated, something calculated to preserve the teeth from decay. In some cases it would be simply more thorough cleansing, and in others an alkaline wash used on retiring, or in bad cases four or five times a day,—a treatment which he had found to produce in many cases very gratifying results. The solution he prescribed is as follows:

R.—Sodæ bicarb., ʒij;
 Spirit. gaultheriæ,
 Spirit. menth. pip.,
 Tinct. anisi, aa ʒss;
 Tinct. cocci, q. s.;
 Aquæ, q. s. Oj.—M.

Dr. Harlan, of Chicago, a member of the committee, then read a supplemental report on the same subject, of which we give an abstract, as follows:

The report first alluded to the debate upon the amalgam question, and stated that it was probable that the question of its fitness for filling teeth would soon be solved. The investigations of Profs. Hitchcock,

Bogue, and Chase, though presenting clearly some things not heretofore, definitely known, were, however, far from proving that this substance was even the best of the baser materials in use.

The report then proceeded to consider the subject of cohesive gold as compared with soft, or non-cohesive. It stated that previous to the introduction of cohesive foil practitioners were unable to save a tithe of the teeth presented. In great measure this was due to inability to control the salivary flow, and further, to a non-adaptability of the form of gold used to a great variety of cases. The conscientious operator doubted his ability to overcome these difficulties, and the tooth, if not doomed to extraction, was filled with an inferior material. A new impetus was given to this branch of dentistry by the discovery of the cohesive property of gold. Though moisture must still be guarded against, a wide field was opened; and the enthusiastic operator attempted often to construct something that should be perfectly dense and faultless in contour, without much thought of the strength of the structure he was operating upon. Thus the path of progress was obstructed, and the form of gold used was condemned.

Evidences accumulate from month to month, in our societies and journals, of a desire on the part of prominent men to resort again to non-cohesive gold. Mr. Thomas Fletcher stated a few years ago that cohesive gold was a failure, and could not be made tight under any circumstances. Though this was disproved, yet the assertion was accepted by many who had but an imperfect knowledge of the principles involved in the insertion of a cohesive filling. The arguments advanced by those who advocate a return to a system of practice almost wholly discarded a quarter of a century ago are, 1st, saving of time in performing operations, thereby lessening the cost to the patient; 2d, a better preparation of the cavity; 3d, a more perfect adaptation to the margins; and, 4th, greater density, especially on grinding surfaces.

The writer then proceeded to a refutation of these arguments, premising that we must, until some better preventive treatment is discovered, rely mainly on gold, and that therefore the subject is and will continue to be of vital importance. He would ask why the dentists of twenty or thirty years ago, though fully aware of the good qualities of non-cohesive gold, should so suddenly have abandoned it, if it had answered all the requirements? Why was it that mechanical dentistry had declined from about that time, and the demand for artificial substitutes decreased, even though the teeth of our ancestors were of a better quality than our own? Was it because the practitioner of that day had less interest in saving teeth, and more in making substitutes, or because he was unable, with the form of gold in use, to make successful and stable operations? It was because he felt that there was something lacking, and when it was discovered he deserted the

laboratory for the operating-room, and has since to this day been trying to save what had formerly been lost. For this state of things we are indebted to Dr. Robert Arthur, the discoverer of the cohesive property of gold.

The paper then took up the arguments above referred to, and replied to them. In regard to the first one, the saving of time, it was stated that the claim might in part be granted, so far as crown cavities were concerned; but if those were excluded, what remaining class could, in justice to the patient, be filled with non-cohesive gold? Practically, with the exception of a few small labial and proximate cavities, there are no cavities which, if filled as they should be to avoid disfigurement, do not require the strength of cohesive gold. Time then, as a whole, is not saved, because the results are not to be compared, and that is what we aim at. As to lessening the cost, it seems to be a fact that, however desirable such a result might be in practice, yet when capacity, honesty, and an inflexible determination to succeed possess a man, his services are constantly increasing in value, without regard to the length of time required in any operation; therefore this argument carries little weight. As to a better preparation of the cavity, in small cavities the preparation is much the same for both kinds of gold, and for larger cavities it is much superior for cohesive gold, because the walls, if frail, can be cut away and built up to and strengthened by this form of gold, while with non-cohesive gold the act of wedging the gold would fracture the margins unless cut away to a firm border, which if done would leave a wide and unsightly space.

The validity of the third claim, viz., more perfect adaptation to the margins, is denied, because observation shows that non-cohesive fillings in proximate surfaces are much more liable to fail than cohesive, because sufficient tissue cannot be cut away to insure a firm border without marring the appearance of the tooth, and if left the consequence is a chipping off of the margins. Non-cohesive gold is liable to flake around the margins of the cavity, unless great force is used, and at those points the filling is apt to be porous. The most pronounced advocates of non-cohesive gold confess that it is better to finish a filling with cohesive gold, because a denser surface can thus be obtained.

The last claim for non-cohesive gold, viz., greater density of the filling, particularly on the grinding surface, is the weakest of all. The results of experiments by Dr. G. H. Cushing, reported to this association at Detroit, in 1874, prove that this claim is false in theory and in fact. Observation also proves the same, for in examining old fillings of soft foil we often find them so hollowed by mastication as no longer to protect the tooth. In using a non-cohesive form of gold it is impossible to make a perfectly dense filling, and when the force of mastication is brought upon it, the interstitial spaces are

filled up, the filling settles and flakes, and a hollowed appearance is produced, while when cohesive gold is used, good service will be done by a well-adapted filling, without wearing away, even though it be not perfectly dense. The practice of the past is not sufficient for the present; more is demanded of us, because the teeth of this generation are worse than those of the past, and the protection of all surfaces becomes imperative. In the use of cohesive gold, the highest grade of skill is attained, the nature of that form compelling the operator to proceed step by step, and put to the best use whatever ability he may possess, while the result attained is far superior to that by any other method. By this plan a coherent mass is obtained, while by any other the particles are merely in apposition, and no dependence can be placed on the strength of the filling itself; the walls and margins have to sustain the strain. The perfect contouring of teeth is an absurd hobby, but a wise conservatism demands the perfection of good judgment.

A cable telegram was received from the American Dental Society of Europe, in session at the Grand Hotel, Paris, conveying the greetings and good wishes of that body; and on motion, the president and secretary were instructed to respond in an appropriate manner, at the expense of the association, and this was accordingly done.

(To be continued.)

AMERICAN DENTAL CONVENTION.—TWENTY-SECOND ANNUAL SESSION.

(Continued from page 539.)

FIRST DAY—*Afternoon Session.*

DR. JOHN ALLEN read a paper on Continuous-Gum, which was discussed.

Dr. Millard said that he had few applications for this kind of work; it was not wanted on account of its price. The people were not educated up to an appreciation of it.

Dr. Buckingham. The mechanical branch of dentistry is now almost beneath the dignity of the profession; but it is as necessary as the other branch. He would not advocate artificial teeth as compared with natural, but, when required, they should be made with as much skill as possible. There is more skill required in this branch than in filling. Good dentists take this work, but have it done outside of their offices. If these men would let this branch entirely alone it would be better. They keep the price down, and that is the way quacks get into dentistry. Forty years ago, the work-bench stood beside the operating chair; the work done now is not as good as it was thirty years ago. Dr. Wildman, who made his own teeth twenty-five years

ago, was, in later years, obliged to sell his furnace because there was nothing to do in the way of manufacture of teeth; the teeth procured from the depots cost so much less. Nothing has done more harm than rubber; any one, with forty-eight hours' instruction, can put up a set in some manner, and that is the reason we have teeth made for three dollars a set. This branch cannot be brought up while these men who live in the big houses will work so low, and in that way.

Dr. Wetherbee. Until the profession, every man of them, shall say to students, "You can't come in unless you will stay three years, and learn mechanical dentistry," and until the colleges require that every man shall make a perfect set, on a metallic base, this thing will not be cured. Every young man should feel that he must perfect himself before he can receive a diploma. Some of the patients who patronize these cheap men are stingy, and want the cheapest; others are poor and wish to economize; but they had better pay three or four times the price and get good work. There is no kind of work that comes up to continuous-gum. We call upon the profession to advocate that which is best. He takes no students for less than three years, and makes it a point to look after the interests of the profession and the community as well as of the young men.

Dr. Walker. The trouble is with the dentists, who will not educate themselves and their patients up to appreciate a standard of perfect work. It is the fault of those who have introduced these compounds. If we could impress on the minds of those who manufacture sets the importance of doing it as it should be done, we should get rid of the trouble.

Dr. Wetherbee said that he could not adopt the idea of divorcing the two branches; they should go together. It is impracticable outside of large cities. There is only one man in Boston who devotes himself to carving.

Dr. Buckingham. Students are kept in a laboratory; they know nothing of impressions, or anything except the coarser parts of the work, and, after they have learned this, they are employed to do it and nothing else. He does not know a prominent dentist in Philadelphia who does his own artificial work. We cannot separate the branches so long as these men will do work at these prices. Continuous-gum work is best, but has objections which prevent its use. It is heavy, clumsy, and difficult to repair. The best class of work made here is gold, with celluloid or rubber attachments. Celluloid is much better than rubber. Continuous-gum is only a little better than celluloid in regard to the color of the gum. There are five hundred or a thousand sets of cheap work made to one of continuous-gum, and he did not know of its being used at all in Philadelphia.

Dr. Reynolds, of New York. An operator should control his artificial work. He had turned over his patients to one who did that

class of work, and found that, when they wanted any filling done, they would go back to the plate-maker. He now does his own work. Uses continuous-gum for two-thirds of his full sets.

Dr. McDonnell. The first cause of this deterioration is rubber, and the second, a desire to make or save money, both on the part of the patient and operator. Eighteen years ago he had made continuous-gum and fought rubber, but he had to yield or lose his practice. Dentists could get a boy to make their rubber-work while they operated at the chair, and make more money; and in a few months the office-boy became a dentist.

Adjourned.

SECOND DAY—*Morning Session.*

The subject of Mechanical Dentistry was still under discussion.

Dr. Tees, of Philadelphia, said that to his knowledge there were a dozen men in Philadelphia making continuous-gum work. They were doing it quietly, but the work was its own advertisement. The great objection to it was its high price; he could not understand why it should cost more than gold, and if the price were put down it would do a great deal towards suppressing rubber. He has no difficulty in inducing patients to take it. He thinks that rubber has been a godsend to thousands, though there are some that cannot wear it. If it was not for rubber, millions would have to do without teeth. People do not take continuous-gum because an exorbitant price is charged for it.

Dr. Wheeler, of Mobile, said that he understood that continuous-gum was principally adapted to full sets; a majority of plates inserted are partial, and he would like to know whether it was fit for them. Can teeth be added as they are lost? If so, this work should be adopted.

Dr. Ambler, of New York. Teeth made thirty years ago were far more natural in appearance than those now made; there is scarcely a set which is not its own herald of falsity. It is no "art concealing art," but a proclamation of the art. He attributes this to the use of block sections. Beauty is demanded, and we cater to the demand. If he wants a correct match for a natural tooth, he goes to his collection of teeth made thirty years ago. How shall we get over the difficulty? By abandoning blocks and using single teeth. Manufacturers do their best, and cater to the demand. There is no delicacy now, on the part of the wearer, about having false teeth, and no concealment. Continuous-gum comes nearest to perfection. It is not applicable to partial sets, as a rule, with the exception of lower cases. There can be no fixed rule, except to imitate nature closely. He had been so disgusted at the appearance of artificial teeth that he had had to change his seat at a public table to avoid the sight of them.

Dr. E. W. Foster, of Baltimore, alluded to a statement that had been made in the American Association in regard to a college graduate

wanting a "set of continuous-gum mounted on rubber." He was surprised at such a statement, and supposed that all colleges taught it. He had never been able to imitate nature so closely with any other material as he could with continuous-gum. The low state of mechanical dentistry is owing to the vegetable compounds, and we are responsible for it. He is in favor of good paying prices; low ones are one cause of the degradation of mechanical dentistry.

Dr. John Allen. It has been asked whether continuous-gum is adapted to partial sets. It depends very much upon the case. It is best for partial lowers, but not for scattering sets above. Gold is the best for such, except when the six front teeth are gone. Objection had been made as to the weight. This was no objection: atmospheric pressure will sustain a heavy plate as well as a light one. It makes no difference whether it weighs twenty, forty, or ninety pennyweights. The patient cannot tell the difference if the plate fits well. He does not depend upon an air-chamber, but simply makes a depression in the plate to relieve the pressure upon hard or bony palates. It is a matter of indifference about the form of the depression. The price should not be cut down, as had been suggested; the principle is wrong. The more you cheapen the work the more you encourage quacks, and continuous-gum will be reduced to the same plane as rubber. The result would be miserable work. Cheap work curses and ever has cursed our profession. Many people think a set of teeth is a set of teeth, although they know very well that one dress is not the same as another. Let the patients understand that there is as much difference in teeth as in anything else: there are those who want the very best.

Dr. Hunt, of Washington. Dr. Allen has given us a standard to which we should strive to attain. It is the most perfect of any class of work. Our profession has done its duty toward operative dentistry, but it is sadly deficient so far as artificial work is concerned. Manufacturers have made improvements in their moulds because they have been demanded. The profession is to blame for the low state to which mechanical dentistry has fallen, because they submit to the popular demand. Why do we not say that because patients want teeth extracted we must extract them? It is our duty to educate patients, and not allow them to dictate. If we are united, we can place mechanical dentistry on the same plane as operative.

Dr. Walker. Something has been said about cheapening work. Where this is done the work is deteriorated. We want to face about and abandon the infernal poison we have been using.

Dr. Allen. Operative dentistry has been tending upwards, and commands higher prices than forty years ago, while artificial work has been running down.

The subject was then passed.

The committee to whom the recommendations of the president's address were referred reported the following: 1. Should there be a preliminary examination before matriculation in our dental colleges; and if so, what should be the requirements? Are the titles of A.B., A.M., or M.D., essential? 2. Should not the dental colleges furnish the student with all the information necessary to his profession, medical, chemical, and artistic, outside of a good common school education? 3. Should a dental diploma signify that its bearer has pursued his profession a certain length of time, or that he has acquired a certain proficiency? 4. Who shall confer the dental diploma? 5. Will this convention approve of and assist in the movement inaugurated by the society of the State of Maryland and District of Columbia, and aided by the United States Government, to gather statistics bearing upon dentistry? In regard to Prof. Buckingham's address, he recommended that hereafter members of the convention be received only through a committee appointed for that purpose.

R. B. WINDER, }
J. TAFT. } *Committee.*

The subjects were then taken up in order for discussion.

Dr. Wetherbee. The time has passed when a student should be allowed to matriculate without a good English education. Students who could not write their own names have applied to him. That they should have a good common school education is apparent; whether they should have an academic education is debatable. It may not be necessary, yet it is to be wished for. Knowledge is power, and the more knowledge one has, the more he is calculated to honor his profession. Medical colleges do not require an academic education; when they shall do so, there may be necessity for our requiring it. The best common school education implies a course of study for eight or ten years. A graduate of a Boston school is considered competent to go out into the world. Colleges should institute an examination as to education and aptitude for the profession. Some well-educated men have no aptitude. It is the duty of the dean to advise such to seek some other calling; and if this was carried out, some men would escape the odium of failure. It is possible for colleges to give to their students all the information in surgery necessary to make them competent for all cases.

Dr. Hunt said he was glad to hear the last speaker say that there should be a preliminary examination. It is due to the faculties that they should have the privilege of selecting the material on which they are to work, and then they have the responsibility of doing the best they can.

Dr. Buckingham. All will agree that a good English education is

necessary; but how much further should we go? Should the examination include dental knowledge? And if so, how much? A classical education is no objection, but is it essential that the dental student should be an A.M.?

Prof. Winder. The dental college should be able to educate a man in everything pertaining to dentistry, commencing with a clean slate. He would not consider it indispensable that a student should know anything of dentistry before admission, but the more he knows the better.

Dr. Walker. What does a diploma mean? If only that a student has spent a certain length of time, and the time is limited, he should have certain previous acquirements. If it means that he is a finished artist and has a sufficient amount of knowledge to deserve the confidence of the community,—if it means this, as it should, the question of previous education falls to the ground.

Dr. Dorsey, of Maryland, thought a man should have office instruction before he goes to the college for preliminary examination, and not go there a perfect greenhorn.

The president, Prof. Coy. Many of the suggestions made are impracticable, and would require ten years' time of study. Students generally are in a hurry to get through and begin to earn something; if they have plenty of money they generally keep out of dentistry. Students should not be examined in dentistry before entering. Those who come with a clean slate make the best record; they do not have to have the crooks taken out of them, or get clear of what they have learned wrong. He insists on a good English education, but on nothing else except a good moral character. Credentials as to moral standing should be required of students who are not known. There are plenty in the profession who ought to be in Sing Sing, but we do not wish to foster that class. Colleges should not receive those unfit to enter for the sake of adding to their numbers.

The second subject of the report was then taken up, viz.: Should dental colleges furnish the student all the information necessary to his profession, medical, chemical, and artistic, outside of a common school education?

Dr. Buckingham thought it was self-evident that they should. Dr. Garretson takes the position that a dentist must understand all medical and surgical knowledge. He should undoubtedly have a general knowledge of anatomy and pathology, and a special knowledge of the head, but it is not necessary that he should know how to amputate a limb. It is a question whether he ought to treat strictly surgical diseases. If there were no doctors it would be different. When a patient has tetanus, should he be treated by a dentist? He should be handed over to the specialist in that branch. Medical men should have a knowledge of operations upon teeth, but is it necessary that they should

be able to perform the operations? It is not. A dentist cannot get knowledge of all branches without taking time that should be devoted to something else. Dentistry is enough for one man. There are many surgical operations performed that we may see what can be done, and what human nature can stand. The man who saves things is better than he who destroys. He would not limit colleges in their teaching; but if we have separate colleges for medicine and dentistry, we must have a line between them. The pathology and physiology taught by each will be the same, but the means used must be different. Practice must be had in addition to knowledge; no man can practice medicine successfully without studying cases constantly, and no man can practice both medicine and dentistry without failing in one or both.

Dr. Wetherbee. How many medical men can diagnose a simple case of neuralgia? He could recall any number of such cases, some of which had been treated for years by physicians of even forty years' practice, every one of which yielded to dental treatment. In the medical colleges less attention is paid to the dental organs than to any other part of the body, and medical students are very ignorant of them. Even medical practitioners are very ignorant, or very forgetful; they talk about "back-teeth" and "jaw-teeth." Dentists are able to perform operations in minor surgery about the oral cavity better than nine physicians out of ten. He is in favor of keeping the profession well up and well educated, and retaining our own distinct degree; he does not believe in being swallowed up in another profession.

Dr. Walker said he had known of medical men injuring their own children beyond remedy by ignorance on dental subjects. A knowledge of surgery is not necessary to a dentist; but a knowledge of digestion is essential to a well-informed dentist. Colleges should be prepared to furnish all essential knowledge of medicine, surgery, and chemistry beyond a common school education. The profession comprises a great deal of knowledge widely severed; no calling requires a higher degree of ingenuity or a more intimate knowledge of art.

Dr. Wheeler, of Mobile. The medical colleges do not make physicians, nor the dental colleges dentists. The latter are doing the best they can. Students will derive benefit by extending their studies outside of those taught in the dental colleges; it will give them standing with the medical profession, which will be beneficial. If we have a good medical education we show ourselves to be in sympathy with that profession, and will derive great benefit therefrom.

Dr. Duck, of Baltimore. The study and practice of dentistry are too much for any one man to attain the highest development in. Every one should devote himself to a specialty. The time will come when dentistry will be divided into specialties, as is medicine, and with better results. Dr. Allen and his work is an example of this in dentistry.

Dr. McDonneld advocates a separation of the two professions. Dentists should know more of medicine and doctors more of dentistry. If he wanted teeth filled he would go to a man who made a specialty of that branch, and the sooner we get to the point where we shall be able to get the best skill the better.

Dr. Pettit. Dental colleges do and should furnish all the information required by the dentist. The question is whether the colleges should work alone or with a preceptor. The colleges cannot do it all; the professors cannot give time to individual students sufficient for them to become well versed in practice,—they must have a preceptor. Some students with four months' instruction will make first-class operators; but they are exceptions.

Adjourned.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.—EIGHTH ANNUAL MEETING, JULY 26TH, 1876.

ABSTRACT OF PAPERS AND DISCUSSIONS.

(Continued from page 549.)

DENTAL PROGRESS—FAILURES AND SUCCESSES.

DR. F. M. DIXON read a lengthy paper upon this subject, of which we give a brief condensation: The writer first alluded to the state of dentistry fifty years since, when it was upon the same plane as the callings of the barber and the blacksmith, except in a few cases in the cities. The province of the itinerant was simply to extract teeth and sell toothache-drops. When the properties of certain acids were discovered, powders and washes were added to the stock of the peddler, and he frequently provided himself with turnkey and file, and tacked on the use of these instruments to his other acquirements. Later, these men discovered that ivory could be fashioned to resemble an incisor, and, fastened by a wooden pivot, could be made to do duty as a human tooth,—and so dentistry advanced.

Then it was whispered that decaying teeth could be saved by plugging, and ere long the fashion became common. Barbers, blacksmiths, and peddlers became surgeon-dentists in large numbers, each concealing his secret modes. Yet progress was made, the needs of humanity increased, and more intelligent men sought the ranks of dentistry. It grew apace; its ranks were dotted with noble, generous natures who freely gave to all who asked. All honor to their memories! They worked not only for bread and a competence, but to alleviate suffering, working and thinking by day, investigating and experimenting by night, and improving and increasing the sphere of dental usefulness.

It is by their toils and discoveries that those of us who are only imitators obtain the means of benefiting our race. Let us be thankful that they lived and still live, to give us improvements whereby our labors are rendered more effective and less fatiguing, which crowd so rapidly as scarcely to give plodders time to learn the use of one ere another claims his attention and his purse.

Though there were so few who felt the need of advancement, and were ready to do what lay in their power to spread education and advancement, and so many without ambition other than to plod along the beaten track, yet to the credit of hundreds of these it can be said that no sooner were the evils of illiberality and ignorance sounded than every nerve of those who heard vibrated with generous impulse; ambitions were aroused and inquiries set on foot; mouths closed were freely opened; each was anxious to acquire, ready to impart. The means of education were not sufficient; there were special schools for all other branches, but none for dentistry. But the thought once conceived was soon carried out. Societies were formed, and an effort made to establish dental chairs in medical colleges. That effort failing, dental colleges were created, whose glorious successes since are now familiar. Some are inclined to consider that because these institutions are not faultless they are worthless; but if we would progress we must encourage everything that disseminates light, and though there may be men in the faculties who are not what they ought to be, yet they should be upheld; at the same time they should feel that the eye of the profession is upon them, and they will not dare to stop until they have reached that standard of excellence demanded by circumstances. The aggregate results of these institutions are grand, as can be seen by comparing the annals of previous years with those of the past forty. Every encouragement we extend to them is a help to the cause of education; every discouragement a clog to the wheels of science.

The paper then discussed the causes of failure on the part of some operators to make excellent fillings and save teeth, especially under difficulties. The writer considered the most frequent one to be the entire absence in the operator of natural mechanical genius and acquired skill. Many such seem to be in the profession, and labor simply for their bread, being no better fitted for this calling than for any other. If any effort that is put forth must be abortive, it is that of the man who would be a dentist without natural taste or acquired ability for his duties. Better for such men that instead of attempting to pack gold into human teeth, they should pack off to Australia and endeavor to exhume the precious metal from its bed. Thousands of failures result from pure indolence and consequent slovenly operating by those who could produce most excellent results by conscientious effort. Slovenliness and indolence commonly exist together, and the dentist

fond of ease can only be saved by the possession of a conscience, which a lazy dentist is as much out of place without, in our hard-labor-demanding service, as a cat without claws in a dog-kennel; and he should find some easier means of supplying his needs. Young men must fight this battle in youth, or it never will be won. Another source of failure is the absence on the part of operators of any appreciation of the value of absolute perfection in all the branches of the work they undertake. There are such by hundreds in the professions, and in the trades by thousands, and nothing can ever make them masters. One who lacks it must, as a dentist, meet with failures innumerable. His instruments will be ill formed and rusty; his cavity only half prepared, his fillings, though appearing solid, will be incomplete, and decay finally, and perhaps swiftly, render his possibly well-meant efforts fruitless. Many such men are honest, and think their work as good as the best. They are to be commiserated, sought out, and taught to do better, and will eventually make useful workers. Another class of failures arises from those characters who have reached such a pinnacle of excellence that their works are all perfect. They could not be convinced to the contrary, even by their own senses. Failure with them is impossible. Perfection should be aimed at always, but he who in his own estimation has reached it will from that time begin to retrograde. Failure to make fillings remain in place and preserve the tooth ought not to exist, save in isolated cases. Though it is a fact conceded by all that circumstances will now and then combine to foil the best efforts of the generally most successful men, these are usually the result of accident, and the failure must be made good upon the first opportunity. If procrastinated it will soon result in mischief, both to the tooth and to the habits and reputation of the operator. Some of the most astonishing shortcomings are excusable in these days of advanced dental science; it is the duty of every man who fills teeth to save the surface on which he operates for life; and yet we find almost as many shortcomings in the simpler cavities as in the most difficult. This, in many cases, seems to be simply the result of stupidity or carelessness. The man who performs this class of duties imperfectly neglects that which it is his bounden duty to do perfectly well, and his neglect results in the loss of the tooth, or its preservation at most in the form of an unsightly fragment. Failure in operative dentistry involves the want of success as a dentist, important as are other branches. But the term failure is often applied with great injustice; a filling can only be said to have failed when it has been so defective that from this cause alone decay is not arrested. Often when the cry of failure is raised this is not the case. Thoughtlessness often leads to an unjust condemnation of another's work,—a thing that should always be avoided. In other professions, and even

in the trades, the non-attainment of the object aimed at is not considered failure. A physician is not considered to have failed because his patient dies, nor a lawyer because he loses his case. The best that could be done has been done, and it is therefore not a failure. In many cases it is quite unexpected that a cure should be effected by the physician; and his services are called for year after year, in a recurrence of the same disease. The case is analogous to that of a positively well-filled tooth, which from constitutional weakness or surrounding influences has failed within a year. The same principle obtains in law; the attorney is paid, even beforehand, for services to be rendered, and if he loses his case his effort is not adjudged a failure; on the contrary, renown has been gained in cases where the pleading has been in vain. The clergyman also is paid for efforts to convert his flock, even though the whole congregation remain as before. In mechanics, too, the same is true; as, for example, the destructive character of climate upon the mastics on the buildings of St. Petersburg, which are renewed every year by the same men at heavy cost. Patients do not expect uniform success at our hands, except as they are influenced by the representations of those who think that to build their own fortunes they must level to the dust the reputations of others, by not only concealing failures of their own work, but ostentatiously proclaiming those of others, parading them in a bottle labeled with the name of the supposed maker, as an evidence of his failure, when possibly he had never seen them. In the office of any honorable dentist the reputation of another such should be guarded even as his own. Good work should be commended, though the tooth may have yielded to destructive elements. The reverse of this is, to say the least, very unfair. The representations of a patient as to the particular operation performed by any specified operator are known to be very unreliable, and any judgment formed upon such a basis may be an act of injustice. All the operator can certainly say is that it was said to be the work of A or B, and that he has bottled it, and possibly should have left it where he found it. Bottles of such fillings would only prove the unscrupulous means by which he sometimes obtains old gold; nor will the exhibitor ever exhibit his own bottle. Not but that positively bad work, such as would disgrace a dentist of the year 1, should be denounced; men who do such work should be gotten rid of by some means; but he who blasts the reputation of an honest operator in this manner, perhaps replacing his work with his own, which is not a whit better, deserves the severest censure of the profession.

The most indispensable requisites to success, then, are first, natural taste and fitness for the profession, industrious habits, and a determination to succeed,—and with these, success in the end is certain. Every failure is to a man so endowed a stimulant to greater efforts; by failure

he learns the magnitude of the work he has undertaken, and succeeding at last, he feels his power to be a useful man. He labors for something better than lucre,—to bring honor upon his calling. Let us see that the profession honor him.

(To be continued.)

THE AMERICAN ACADEMY OF DENTAL SCIENCE.

THE ninth annual meeting of the American Academy of Dental Science was held on Monday, September 25th, 1876, in Union Hall, Boylston Street, Boston. Dr. D. M. Parker presided.

In the forenoon, the annual reports were read.

The Centennial Committee reported that they had prepared a history of dentistry in America during the past one hundred years. Its preparation, involving much labor and expense, is a free gift to the profession.

The following were unanimously elected Fellows of the academy :

Drs. M. S. Dean and Dr. G. H. Cushing, Chicago ; W. A. Bronson, New York ; J. W. Curtis, Brunswick, Maine ; H. E. Smith, Boston.

The following were elected officers for the ensuing year :

President.—D. M. Parker, M.D.

Vice-President.—E. G. Tucker, M.D.

Corresponding Secretary.—Geo. T. Moffatt, M.D., D.M.D.

Recording Secretary.—W. Lewis Tucker, D.M.D.

Treasurer.—L. D. Shepard, D.D.S.

Librarian.—John Clough, M.D.

Board of Censors.—J. L. Williams, M.D. ; W. W. Codman, M.D. ; E. N. Harris, D.D.S.

At the afternoon session the annual address, prepared by Dr. Robert Arthur, of Baltimore, was read by Dr. Geo. T. Moffatt, of Boston. The subject treated was on the importance of a more scientific study and practice of dentistry instead of considering it a merely manual art.

The thanks of the academy were voted to Dr. Arthur, and a copy of the address was requested for publication.

Dr. Thomas Fillebrown, of Portland, Maine, then read an interesting paper on "Specialties," at the close of which he offered the following resolutions, which passed unanimously :

Whereas, Dentistry is a specialty of the science of medicine ;

Resolved, That a thorough medical education is essential to the most successful practice of it.

Resolved, That we deem it expedient and for the best interests of the practice of dentistry that existing medical schools enlarge their courses of instruction so as to include efficient instruction in the specialty of dentistry, in order that it may be placed on an equality with other specialties of medicine.

Dr. C. A. Brackett, of Newport, Rhode Island, next read a paper on "Good Judgment an Essential Qualification for the Dentist." Dr. E. W. Foster, of Boston, followed with a paper on "The Oral Cavity and the Functions of the Teeth."

After discussion of the address and essays, the members adjourned to the Parker House for the ninth annual dinner.

W. LEWIS TUCKER, D.M.D., *Recording Secretary.*

MISSISSIPPI STATE DENTAL ASSOCIATION.

THE second annual meeting of the Mississippi State Dental Association was held in Jackson, Miss., August 16th, 1876. Dr. J. D. Miles, president, in the chair.

The Executive Committee reported the following names for membership, who were elected: Dr. W. T. Martin, Yazoo City, Miss.; Dr. R. J. Miller, Raymond, Miss.; Dr. G. W. Rembert, Fayette, Miss.; Dr. T. O. Payne, Canton, Miss.; Dr. E. E. Spinks, Meridian, Miss.

The president delivered the annual address.

A paper on "The Treatment and Capping of Exposed Nerves" was read by Dr. Hilzheim.

Dr. Payne introduced the subject of "replanting teeth," and gave the histories of several cases in which he had met with great success. Dr. Hilzheim mentioned one case in which eminent success had crowned the operation,—the only case he had attempted.

Dr. Martin exhibited an inter-dental splint which he had used with entire success in a case of fracture of the inferior maxilla. He also exhibited some fine specimens of exostosis, also a case of osseous union of the roots of two adjoining teeth.

Drs. Payne and Hilzheim advocated the use of celluloid as a substitute for rubber.

The following officers were then elected to serve for the ensuing year:

President.—Dr. J. B. Askew, of Vicksburg.

Vice-President.—Dr. T. O. Payne, of Canton.

Secretary and Treasurer.—Dr. A. Riser, of Port Gibson.

The following delegates were elected to the national associations:

To the American Dental Association.—Drs. A. H. Hilzheim and W. T. Martin.

To the Southern Dental Association.—Drs. J. D. Miles and G. W. Rembert.

Executive Committee.—Drs. J. B. Askew, J. D. Miles, R. J. Miller.

Committee to secure the passage of a dental law through the Legislature.—Drs. A. H. Hilzheim, J. D. Miles, R. J. Miller.

Committee of Arrangements.—Drs. A. H. Hilzheim, T. O. Payne, W. T. Martin.

Adjourned to meet at Canton, Miss., the third Wednesday in August, 1877.

A. RISER, *Secretary.*

MERRIMACK VALLEY DENTAL ASSOCIATION.

THE fourteenth annual meeting of the Merrimack Valley Dental Association will be held at the Parker House, Boston, Mass., Thursday and Friday, November 9th and 10th, 1876, commencing at eleven A.M. on Thursday. Essayists: Dr. I. J. Wetherbee, of Boston: subject, "Dentistry in the Centennial Year"; Dr. L. W. Puffer, of North Bridgewater: subject, "Success"; Dr. L. D. Shepard, of Boston. Volunteer essays may be expected from other members. Clinical operators, Dr. I. A. Salmon, of Boston, and Dr. L. D. Shepard, of Boston, who will use the magnetic mallet. Subject for discussion, "Dental Irregularities, with a view to a clear and definite understanding of Remedial Methods."

Each member of the association is earnestly requested to prepare and present models with the correctional fixtures attached, representing one or more cases in actual practice. It is believed by the committee that such a comparison of methods will tend to evolve a more uniform and simple system in this important department of dental surgery.

All respectable members of the dental profession are invited to be present and join the association.

W. E. RIGGS, *Secretary.*

SUSQUEHANNA DENTAL ASSOCIATION.

THE semi-annual meeting of the Susquehanna Dental Association will be held at the Crawford House, Williamsport, Pennsylvania, Wednesday, November 15th, 1876, at ten A.M.; session to continue two days. Subject for discussion, "Deciduous Teeth and their Treatment."

Action will be taken with reference to the new law governing the practice of dentistry in Pennsylvania.

J. H. JOHNSTON, *Recording Secretary.*

BROOKLYN DENTAL SOCIETY.

THIS society held its annual meeting Monday evening, October 9th, 1876. The officers elected for the ensuing year are as follows:

President.—H. G. Mirick.

Vice-President.—W. W. Starr.

Recording Secretary.—C. P. Crandell.

Corresponding Secretary.—Wm. Fishbough.

Treasurer.—F. W. Dolbeare.

Librarian.—C. E. Mensch.

C. P. CRANDELL, *Recording Secretary.*

GEORGIA STATE DENTAL SOCIETY.

THE eighth annual meeting of this society was held in the city of Atlanta, May 10th, 11th, and 12th, 1876.

Officers for the ensuing year:

President.—Dr. L. D. Carpenter, of Atlanta.

First Vice-President.—Dr. M. H. Thomas, of Crawford.

Second Vice-President.—Dr. J. P. Holmes, of Macon.

Recording Secretary.—Dr. Wm. Crenshaw, of Atlanta.

Corresponding Secretary.—Dr. M. S. Jobson, of Perry.

Treasurer.—Dr. H. A. Lowrance, of Athens.

Standing committees:

Histology and Physiology.—Drs. George Paterson, of Waynesboro', and E. Parsons, of Savannah.

Pathology and Surgery.—Drs. J. P. Holmes, of Macon, and J. A. Chapple, of La Grange.

Chemistry and Therapeutics.—Drs. J. H. Coyle, of Thomasville, and M. H. Thomas, of Crawford.

Operative Dentistry.—Drs. A. L. Smith, of Valdosta, and J. M. Mason, of Macon.

Mechanical Dentistry.—Drs. M. S. Jobson, of Perry, and G. W. McElhaney, of West Point.

Education and Literature.—Drs. Wm. C. Wardlaw, of Augusta, and H. A. Lowrance, of Athens.

Arrangements.—Drs. J. P. Holmes and D. S. Wright, of Macon.

Clinics.—Drs. S. G. Holland, of Atlanta; M. S. Jobson, of Perry; J. A. Tigner, of Cartersville; and R. A. Holliday, of Atlanta.

Executive Committee (which is also the State Examining Board under an act of the General Assembly of the State).—Drs. Arthur C. Ford, of Atlanta; W. F. Tigner, of Columbus; E. Parsons, of Savannah; Wm. C. Wardlaw, of Augusta; and John H. Coyle, of Thomasville.

The next meeting will be held in Macon, on the second Tuesday in May, 1877. All dentists in good standing will be welcomed.

Essays or communications in the interest of the society are invited, and will be read or laid before the society if sent to the corresponding secretary.

M. S. JOBSON, *Corresponding Secretary.*

EDITORIAL.

TO READERS AND CONTRIBUTORS.

AN unusual demand for space in our columns for original communications and reports of societies, has compelled the omission of our customary *Periscope* and the *Hints and Queries* department, and other matter already in type.

Contributors whose communications have not appeared will find explanation and excuse in the fact stated.

OBITUARY.

DR. L. E. BROCKWAY.

SUDDENLY, of typhoid fever, at Syracuse, New York, September 7th, 1876, DR. L. E. BROCKWAY, of Brooklyn, New York, in the forty-fifth year of his age.

At a regular meeting of the Brooklyn Dental Society, held Monday evening, September 11th, 1876, the following preamble and resolutions were unanimously adopted :

Whereas, Dr. L. E. Brockway has been removed from us by death, we, his associate and fellow-members of the Brooklyn Dental Society, at this our first meeting since his decease, cordially unite in the following resolutions :

Resolved, That we are deeply grieved at the death of our brother, and, in recognition of his character and services to this society and our profession, we desire to place on record our sincere sorrow. Profoundly lamenting his untimely decease, we rejoice in the memory of his many excellent qualities of head and heart. Owing to his modest and retiring disposition, only those who knew him long and intimately could thoroughly appreciate him. Earnest and thorough in the duties of his profession, true to the best interests of our society, amiable and considerate as a companion, warm-hearted as a friend, we feel that in his death this society and the community have lost a reliable, competent, and conscientious practitioner and most worthy citizen.

Resolved, That the secretary of this society be directed to send a copy of these resolutions to the family of the deceased, with assurances of our sincere sympathy in their bereavement, and that these resolutions be also published in the Brooklyn and Syracuse daily papers, and in the dental journals.

W. H. ATKINSON, *President*.

C. P. CRANDELL, *Recording Secretary*.

THE
DENTAL COSMOS.

VOL. XVIII. PHILADELPHIA, DECEMBER, 1876. No. 12

ORIGINAL COMMUNICATIONS.

DENTAL PATHOLOGY AND THERAPEUTICS.

BY J. FOSTER FLAGG, D.D.S.,

FORMERLY PROFESSOR OF DENTAL PATHOLOGY AND THERAPEUTICS IN PHILADELPHIA DENTAL COLLEGE.

[Entered according to Act of Congress, in the year 1873, by J. Foster Flagg, D.D.S.,
in the office of the Librarian of Congress at Washington.]

(Continued from page 566.)

(d) *Thermal irritation*.—When upon this subject previously, the effects of food, and position of cavity, so as to be protected by cheeks, tongue, lips, or gum, were noticed, in modifying the power of thermal irritants.

Under these circumstances it is usually the case that hot and cold applications are rather classed as warning indicators than as positively powerful irritants; but when the cavity is to be filled with materials possessing high conducting qualities, the great danger arising therefrom should be constantly borne in mind.

Probably no other form of irritation has been more frequently the proximate or ultimate cause of death of the pulp, after the performance of tedious, difficult, and very expensive operations, than the one under discussion.

That which might reasonably be regarded as all-sufficient treatment palliative of previous irritation, has often been given,—ample time for assurance of probable recuperation has been allowed,—additional preventive to future trouble has been guaranteed by the careful placing of some non-conductor as an intermediate, and yet, all has proved unavailing from the occasional thermal irritation which it has seemed impossible to prevent.

It is not unfrequently the case that the very care which has been exercised by the dentist in sedulously guarding against danger, has been so far successful as to preclude other than slight sensation from even decided applications of heat and cold; but these slight shocks will be all that is requisite, not only to prevent the re-establishment of

health, but to slowly, yet surely, induce that greater deviation from normality, which, first obtunding the sensibility, finally causes the death of the pulp.

Again, an equal care may not have been sufficient to prevent applications markedly hot or cold from producing decided suffering, and, in consequence, urgent request for great caution on the part of the patient has been made by the operator, as the final effort for the full performance of his professional duty.

The patient will faithfully try to obey directions, but, after many days, an unfortunate shock occurs, which, while it serves to remind of the warning so impressively spoken, but latterly somewhat effaced by so long exemption from pain, also *serves to undo all that has been gained.*

It is *this* which is not generally recognized, and it is this failure of recognition which too frequently permits the introduction of fillings, possessing great conductivity, in cavities where a better judgment would insist upon the renewal, if necessitated, of non-conducting filling material, during a period extending over months and, *it might be, years.*

When, as the reverse of this, shock after shock has been given, instead of the comfort and solid security which might have been gained as the months and the years passed by, we find that a degree of pain will supervene, which, bidding defiance to other treatment, calls for the removal of the filling, under which we will then have a pulp which has endured such long continued, chronic irritation, as to render it likely that an application for the purpose of prompt devitalization of the pulp will prove that which, *with all its own want of permanency*, would be most permanently beneficial.

When giving the *symptoms* of the third form of odontalgia,—due to irritation of the dental pulp from almost complete or complete exposure,—I mentioned that it was *not always positively located.*

In this connection we shall very often find that peculiar complication of *positive, but erroneous, localization.*

Patients confidently ascribe their suffering to teeth which are not at all implicated, and many teeth have been extracted upon such testimony, without affording any other relief than the evanescent intermission due to the *derivation, vascular and sentient*, arising from a greater *mechanical* irritation.

It is not alone teeth which are two, three, or more distant from the offending organs, that are presented to the minds of the patients as the causes for trouble, but it is sometimes true that a tooth of the other jaw, and even upon the opposite side of the mouth from the real irritant, is *positively* judged to be the source from whence all suffering emanates.

Now, while it is comparatively easy to correct such diagnosis by examination in open cavities of decay, it frequently becomes a matter of much difficulty to decide correctly in cases of filled teeth.

For this reason I must urge the utmost caution and the most exhaustive examination and testing before, in any case, resorting to extraction.

I would lay down, as a rule, that *a tooth should never be extracted, for this kind of toothache, solely upon the testimony of the patient.*

There should always be that *corroboration* which is readily afforded from a competent dental examination; and where it is, at first, impossible to obtain this, the tooth indicated by the patient should be so treated as to render the likelihood of its giving trouble a thing of almost positive impossibility.

If there be the least deposition of salivary calculus or tartar, it should be gently, but completely, removed; if there be the least sensitiveness of dentine, an obtunding application should be made to it; if there be the slightest fissure, it should be sufficiently enlarged, and possible irritation from the fluids of the mouth be precluded by a temporary introduction of tin-foil, gutta-percha, oxychloride of zinc, or a medicated pellet of cotton.

If there be a small cavity of decay, it should be temporarily stopped; and, above all, if there be a filling in the tooth, it should certainly be removed before resorting to the *extraction* of this *doubtful* cause for *positive* suffering.

It is hard for me to conceive the necessity for such advice as I have given in these last few lines, and I make this statement as an apology *to myself* for having done so, while my apology for the same, to some of my professional brethren, is the fact, which they will admit, that *many* an apparently *sound* tooth (I do not mean, not carious merely, but, so far as one could judge, after removal, utterly incapable of being a *cause* for trouble) has been *unhesitatingly extracted* without affording the desired relief.

For the completeness of the term "sound" I should only accept a physiological tooth,—and I do not use the word strictly in this sense, but readily admitting that some imperceptible deviation from normality must probably be necessary for the sympathetic selection of any given tooth as the tangible cause for toothache, I must still insist upon the almost universal possibility of *immediate* and *entire* cessation of all *sympathetic* irritation as a concomitant with the removal of the real offending tooth, or the devitalization of its pulp.

(e) *Mechanical irritation*.—This cause for pain, subsequent to filling, can only be viewed as the origin for that *secondary* suffering which might be consequent upon the infliction of injury to the pulp during excavating, and which had, for the time, passed away, as the result of an effort upon the part of the *vis naturæ*, or, as the sequence of a soothing topical application.

(f) *Medicinally*.—These must also now be regarded from the same

stand-point that has been assigned mechanical irritation. Certain applications which are still sometimes used as medicaments in cases of very deep-seated caries, such as creasote, chloride of zinc, chromic acid, nitrate of silver, cobalt, and arsenious acid, are each and all capable of engendering uncontrollable trouble after the filling of such cavities.

Creasote and chloride of zinc can possibly do this,—chromic acid and nitrate of silver will probably do it,—and cobalt or arsenious acid will almost surely do it.

If creasote or chloride of zinc are to act injuriously, they generally do so with much promptness; the first inducing nausea, vertigo, and general uneasiness, and the latter severe, paroxysmal or continuous pain.

If chromic acid or nitrate of silver applications are eventuating badly, a greater length of time, either weeks or months, possibly elapses before the dull gnawing pain, which announces the gradual demise of the pulp, is felt by the patient. Sometimes severe pain is caused by these irritants; but my experience is that a notable length of time intervenes before secondary irritation is set up.

With cobalt and arsenious acid the result is more treacherous and far more deceptive. Many months *usually* pass in a deceitful quiet, which affords comfort to the patient, and promises success to operators; but in the vast majority of cases, after a lapse of time varying from *several months to several years*, a periosteal irritation will be induced, which is directly traceable to the action of one of these latter medicines, although it is a *secondary* instead of a *primary* result.

This sequence will be fully discussed in connection with "periodontitis," but I have thought it desirable that it should be mentioned here as a preparative step to its more complete elucidation hereafter.

I have long felt the advantage of regarding the subject of dental pathology as a *consecutive story liable to pertain to any tooth*, the gradations of which merge into each other with wonderful celerity.

I have always endeavored to impress the opinion that this was due to the combined exposure and hard usage of the organs; their *peculiar* sensibility, derived from the fifth pair instead of through the route of general sensibility; and the *unyielding* character of their physiological attributes and their anatomical surroundings.

My experience indicates that an essential to success in the treatment of teeth is the capability of this panoramic view of all the surroundings in every individual case which is presented in practice, and that, in addition to this, just in proportion as this view is taken, at one glance or in one thought (so to speak), so is the probability of success greatly enhanced.

It is for the accomplishment of this presentation that I indulge in seeming repetitions, with the conviction that in practice they will soon

be recognized as views of the same condition, but from those different stand-points which it will be most satisfactory to have occupied, as one's future experience will afford to them increasing corroborations.

(g) *Prevention of exudation, by filling.*—This cause of irritation is one which, much more frequently than may be supposed, proves fatal to the attempts at pulp conservation.

For the proper appreciation of this means of this irritation it will be necessary to recall the remarks which were given in the commencement of our study of pathology, under the heads of "Determination of blood" and "Congestion" (*DENTAL COSMOS*, May and June, 1872).

We shall there find that "irritation" results in that alteration of functional action which eventuates, at first, in "determination of blood" with its "knowledge of the presence" of an irritant; that this is followed by sensations of uneasiness, decided increase of sensibility and some throbbing, until that further deviation from the normal condition is induced, which we have studied as "congestion," concomitant with which we have a "transudation" or "effusion" of the more watery portion of the fluid of the blood (*liquor sanguinis*) taking place outside of the capillaries, and filtrating or percolating through the cellular structure of membranous, *glandular*, muscular, or other tissue.

This is just the condition in which I wish to present to the mind an irritated dental pulp; but it must also be mentioned that the dentinal investment of the pulp gives to it the same anatomical peculiarity of unyielding surrounding which pertains to the brain, and that, in consequence of this, we shall find that the swelling which ensues as the result of effusion soon becomes the cause of uncontrollable irritation.

Under the ordinary circumstances of yielding periphery, a continuance of irritation has been shown to induce the condition of "true inflammation;" but with brains and pulps we have a positive exudation of fluid into the space which exists between the exterior of these organs and the interior of their osseous or dentinal coverings, and thus, by hydraulic pressure, we have *death* from congestion of brain or pulp, as a termination, instead of the sequence of inflammation.

It has been shown that, in the change from "determination of blood" to "congestion," a diminution of pain usually occurs, and that in place of throbbing we have fullness, numbness, etc., and in place of functional activity we have functional torpidity.

It is from such changes that patients and operators fail to note, as detrimental, these apparently favorable symptoms, and thus, in filling with impervious material, give that final preventive to exudation, which, having before existed either as absolute opening or as excessively thin stratum of dentine, has alone permitted the continuance of vitality in an *almost thoroughly congested* pulp. Soon the effusion aggregates in

such degree as to be incompatible with life, and death of a portion of the bulbous part of the pulp ensues.

This dead portion then in turn becomes an irritant, which gives the addition of paroxysms of toothache to previously existing dull, heavy pain.

It is thus that teeth in this condition fail to respond to hot or cold applications, the dead and congested portions of the pulp serving as sufficient non-conductor for the protection of the still vital filaments within the canals.

It is also at this time that anything less than *decided* striking upon these teeth fails to produce response, from the fact that, as yet, insufficient irritation exists to cause apical (exterior) hyperæmia, in connection with which alone we find increase of sensibility about the roots of teeth.

Thus it becomes, as will readily be admitted, a difficult cause of trouble to diagnose, when a nicely filled tooth which responds neither to examination, thermal tests, nor striking, and which is in no wise painful during mastication, gives rise to neuralgic, otalgic, or other pain, which, to the patient, is not in the least referable to any dental difficulty. And, at the same time, this can only be regarded as an additional incentive to keep constantly in mind the possibilities of such condition, the preventives to its occurrence, and its treatment when diagnosed.

It will be noticed, by reference, that when upon "deep-seated caries," I gave as the fourth cause of irritation, *Conduction, or other irritation after plugging*, and as the remedy for this, *Interposition of non-conducting or porous intermediate material*; and I wish here to make the distinction between the diagnosis of the *necessity for porosity*, which was stated to be comparatively easy, and the diagnosis of this *need having been overlooked*, which, I insist, is almost always much more difficult, and often exceedingly obscure.

(To be continued.)

PROCEEDINGS OF DENTAL SOCIETIES.

NEW YORK ODONTOLOGICAL SOCIETY.

REGULAR meeting of the society held at the residence of Dr. C. E. Francis, 35 West Forty-seventh Street, Tuesday evening, May 16th, 1876.

President A. L. Northrop in the chair.

INCIDENTS OF OFFICE PRACTICE.

Dr. C. E. Francis exhibited instruments, made of platinum, for introducing plastic fillings of any kind, gutta-percha, oxychloride of zinc, etc., claiming they were free from the objection of blackening, caused by

being heated. He also presented a small file of a new pattern, made for filing off approximal fillings.

The president requested Dr. C. S. Stockton to give the history of the case of a boy operated upon for epulis, and, in response, Dr. Stockton remarked as follows:

Dr. C. S. Stockton. The case referred to many of the gentlemen present saw before it came into my hands. The mother of the boy told me that about two years ago she took him to a gentleman in Philadelphia, who lanced the apparent abscess, and drew out a great deal of pus. The trouble was supposed to have arisen from an old deciduous tooth, and the disease went on from that time until about a year ago. I brought the case to the attention of Dr. Atkinson, who has operated upon it, and been very kind in doing so much for the lad, as the mother is a poor woman. I cannot say that there is no doubt in regard to the recurrence of the disease. There is one little point which I am still anxious about. I am not sure that it is going to develop into anything, although it may. This point is on the margin of the gum around the second bicuspid, where it appears not to have been quite reached in the operation. There is also a place upon the opposite side of the mouth that gives me a great deal of anxiety. It is an enlargement near the soft palate, almost opposite the first molar, and I am fearful that there may be something of the same character there as in the original case. If there is any trouble from that the case will be a still more serious one, as it will show that the trouble is in the system.

Dr. W. H. Atkinson. This tumor embraced the point from the first upper molar on the left side to the central incisor, being worse on the inside of the mouth, the festoons between the lateral incisor and cuspid and between the first bicuspid and cuspid not being involved. The character of the disease was an ambiguous one. We treated it two months topically, using a remedy that Dr. A. L. Northrop introduced to me, of iodide of zinc with an excess of iodine, which seemed to do well in reducing the size of the tumor. I soon became convinced that it included the periosteum and osteoplasts. The bone was quite softened, so that it was easily cut. I scraped entirely down to the healthy bone. I call it a fibroid growth of the gums.

Dr. C. E. Francis. Do you suppose the patient could have lived twelve months without being treated?

Dr. W. H. Atkinson. Possibly he might, though I doubt it, if left in that condition without care. We do not know what the original trouble was; it possibly was a constitutional degeneracy. In the operation I scooped the bone, went clear down so as to go above the alveolar process, then ran a large engine-bur through the base of the chasm, and with a fissure-bur ran by the sides of the roots of the teeth, cutting out the diseased portion of the transverse processes of the sockets.

The constitutional treatment was iodide of potassium and iodide of iron. The case is doing well, although not entirely cured.

The following paper, entitled "New-Fangled Machines," by A. H. Brockway, M.D.S., was then read:

Mr. President,—From a recent issue of the *New York Tribune* was clipped this paragraph:

Several dentists, who years ago were at the head of their profession, have retired from business, from dislike of the "new-fangled" machines used in filling teeth.

As the writer doubtless had or thought he had some basis for the statement, I think we may well give it a few moments' consideration; for if, in conducting our business, we are to introduce new machines and appliances at the risk of "losing our heads," we had better give pause and return to the "good old way."

It would perhaps be difficult to decide whether this paragraph is most to be admired for its clear statement of a notorious fact, or for its choice grammar, or for the lambent wit that shines forth in the play upon words in the last lines; but I incline to the belief that, like the various parts of the deacon's "one-hoss shay," they are all equally good, and that the fact is as patent as the statement is elegant and witty.

Nevertheless, something or somebody must have suggested the thought which it expresses.

Now, I am so little in sympathy with this thought, and in fact am so impressed with a belief in the utility, nay, more, the beneficence of some of these "new-fangled machines,"—notably, the burring engine and the rubber dam,—that instead of retiring on their account, I feel more like "advancing" and bidding welcome to whatever will in any like degree multiply my powers, lengthen my years, and increase my power for doing good.

That this estimate of the value of these adjuncts is not shared by all members of the profession I am well aware, and deeply regret, and, though it may seem an ungracious remark, yet, with most respectful deference, I must say that the tenor of the expressions used by those who deprecate the general employment of the engine and dam leads me to fear that for some reason they do not get the best use out of them. Otherwise, how can one operator declare his belief that an instrument driven by the burring engine, and which simply requires *guiding*, cannot be handled as delicately as the same instrument worked by the hand which must both guide and *propel* it? or, how can another assert his ability to prepare with an excavator intricate cavities—of all others the best tests of the value of the engine—in half the time that he would require to change his burs and get the engine into position? or, how can still another conceive no greater

absurdity than to cover, in the use of the dam, six or eight teeth for the purpose of filling a single proximal cavity?

Now, I wish to dissent from these and all kindred views, not in any spirit of controversy or with feelings other than those of sincere regard for those who hold them, but from a conviction that the wide difference in appreciation of these appliances must be the result of difference in the manner of employment rather than of the personal characteristics of various operators, as some have supposed, and I will as briefly as may be set forth my ideas regarding the way to get the best use from them, in order to invite a comparison with the methods of others.

To begin with, then, I am firm in the belief that no one may hope to use to the best advantage, or anything nearly approaching it, either the burring engine or the rubber dam without the aid of a competent assistant; yet how many there are among us who undertake their use altogether without such help, and how many others who employ it but sparingly!

Herein I conceive lies one potent cause of their failure to appreciate them, and the consequent wide difference of opinion as to their value.

It is objected by some that the presence of an assistant at the chair is disliked by many of our patients, but from an experience of several years in the matter, I am inclined to think that the sentiment has little foundation in fact; and even were it true, doubtless most patients would stifle their objections to the presence of a third party could they be shown—as I think they could—that thereby the time necessary for their operations could be shortened more than one-half.

Moreover, the engine and dam require a variety of equipment specially adapted for their use, and without which they are valueless; and yet there are some dentists who from mistaken motives of economy or from carelessness do not provide themselves therewith in any proper manner. I will not stop to designate the various articles which I consider indispensable, but I may be permitted to say just here, so far as concerns the burs and drills used in the engine, that, as generally furnished to us by the manufacturers, they are not highly enough tempered. Observation has seemed to show that they will bear to be tempered much harder than an instrument to be used by hand, and I think too that cavity burs, if coarse-cut and sharp, are, when used on the dentine, less disagreeable and painful to the patient than those of fine cut,—from the tendency of the latter to clog and heat,—as well as more rapid in their work.

It would hardly seem necessary to point out the importance of having the equipment for the engine so arranged and so kept in order as to be most convenient for use; but from the great number and variety of burs, drills, stones, wheels, etc., required, coupled with their diminutive size, as compared with hand instruments of like character and

purpose, this is a matter of some consequence, and is too often neglected by many operators, who lose much valuable time from this cause alone.

So far as I have seen, our dealers in dental materials with all their enterprise have as yet failed to furnish us with a proper stand for instruments of this kind. For myself, I have seen nothing so convenient as a block of sufficient thickness, about five inches long and three wide, in which are rows of holes, one for each instrument. By arranging these in classes and keeping all the holes in the block filled, it will be readily seen that whenever one is taken out and used there is but the proper place in which to return it; so that after a few days of use the hand reaches out for the particular bur or drill required, almost automatically, and with no "bothering" about it.

This may seem a small saving of time and hardly worth noting, but we must bear in mind that "it is the *little foxes* that eat up the vines."

The remarks I have thus far made have applied mainly to the burring engine, but much might be said in the same direction touching the rubber dam; and now I wish to note a point often overlooked by some of those who deprecate the use of these, to me, invaluable, I might almost say indispensable, aids to practice; and that is, that they are *complementary* to each other, and the best use of either can never be obtained from one alone. How important it is that the cavity should be kept dry while being excavated probably all present will admit, and how equally desirable it is that this operation should be as brief as possible, such of you at least as have had any personal experience of the discomfort of wearing the dam will not be slow to acknowledge; and just here I wish to point out what I consider a needless and painful practice on the part of some in the use of the rubber, and it is that of ligating teeth beyond what is requisite for the occasion. Though I advocate the practice of covering not only the teeth to be operated upon but several (an average of at least six) contiguous ones,—and this I do not only to get light and room in which to operate, but, paradoxical as it may seem, in order to save time in putting the dam on,—yet I am content with ligating one or at most two teeth, instead of five or six, as I have sometimes seen done, to the great hurt of the patient and without a particle of advantage to the operator.

I am tempted to go on and criticise the manner of using the dam which many employ, but I set out merely to indicate if possible some of the general causes which lead to the divergence of opinion on the use of the engine and dam among various operators; and having done what I could in the brief time at my command, I will conclude what I have to say by reading, in support of the favorable opinion which I entertain and have tried to express, some statistics compiled from the daily record which I make of my operations; and I may be permitted

to say that, as I well know, they might be confirmed by the experience of several excellent operators whose methods are similar to my own. As I have before observed in these meetings, I make use of the engine and dam, in nearly every case, from motives of economy in respect to time.

I find that in the course of eighteen consecutive days' practice I used the dam as follows :

UPPER JAW.

LIMIT OF APPLICATION.	TIMES.	TEETH INCLOSED.	TIME.	CAVITIES FILLED.
Third molar.....	4	9	2 minutes	2
Second molar.....	4	8	2½ "	3½
First molar.....	14	7	2 "	2
Second bicuspid.....	3	6	1½ "	1
First bicuspid.....	2	5	2½ "	1½
Cuspid.....	1	4	¾ "	1

LOWER JAW.

Third molar.....	8	10	2½ "	3
Second molar.....	10	9	2½ "	2½
First molar.....	10	8	1¾ "	1½

It will be seen that the average time required to apply the dam was about one minute per cavity. The dam was invariably applied before beginning to excavate, and the average time per cavity to prepare and fill was a trifle less than fifteen minutes. This of course included both temporary and permanent fillings, of various materials, such as were requisite for the cases presented.

These figures are conclusive to me of the great value of the articles under consideration in the saving both to the dentist and his patient of time, money, labor, and suffering ; while, as I believe, greatly improving the quality and permanence of the operations.

Discussion.

Dr. E. A. Bogue. Please describe your method of applying the rubber dam ; suppose the tooth to be a lower third molar.

Dr. A. H. Brockway. I use a piece of dam about ten inches long and five or six inches wide. I see what teeth, if any, are missing, and at the same time, I notice if there is any irregularity which would make it difficult to get the dam between the teeth. If I judge there is, I provide for that in advance by using a thin piece of platina wire or some thin steel ribbon that will go between any teeth, no matter how closely wedged they are. After noting the number of teeth I wish to surround with the dam, I lay it upon the back of whatever is handy, and punch holes corresponding to the teeth to be covered.

Dr. O. E. Hill. I am glad to hear somebody say that it is not necessary to use up all day in filling a tooth. I must admit that Dr. Brockway's average time is less than I should have supposed it to be. But I am certainly glad to see that some one demonstrates the possibility of doing work well and doing it quickly. If I understand Dr. Brockway, fifteen minutes is the average for preparing and filling?

Dr. A. H. Brockway. Yes, sir.

Dr. O. E. Hill. That is a wonderfully short time. Of course, ap-proximal cavities sometimes take much longer; but an ordinary cavity in the crown of a molar or bicuspid frequently requires but eight or ten minutes to fill and fill well. I think that for the last eight or ten years we have been *pounding* teeth altogether too much. I believe more trouble has been caused in that way than in any other.

I cannot indorse Dr. Brockway in covering so many teeth with the rubber dam. We must not afflict the patient any more than is necessary in that way, nor must we forget that the patient is alive, and sensitive to all our operations.

Dr. B. Lord. I have a great deal of feeling on questions brought forward by Dr. Brockway in his papers, but I am not apt at expressing myself. However, I cannot sit still and allow the subject to pass without a word. It is a very common saying that it is wonderful how we differ in our views and modes of practice. I have thought that perhaps it was because there are so many methods of arriving at the same results in the operations that we perform. Of course there are certain great principles to which all must adhere, to a great extent, in order to arrive at the best results.

I am no better prepared to look into the future than any of my brethren, but I verily believe that in ten years or less all the burring engines will be thrown aside, or, at least, they will not be used to anything like the extent they now are. In fact, I believe that they are not used now as much as they were two or three years ago. I have tried them faithfully, but find I have of no great use or need for them. I can occasionally use an engine to advantage, but very seldom. With my hand instruments I can do the work more delicately, more rapidly, and with more satisfaction to myself and to my patients generally; and I believe that if we were to spend the money for hand instruments that we do for dental engines, we would make better operations—we would develop the art to a higher degree. In separating the teeth I would occasionally find use for the disk, and if I wished to drill into the pulp-chamber, I would find an engine very desirable; but I do not believe that it is an instrument for general use in operating upon the teeth. I think it has been used too much. But few dentists can use it to advantage; and those who do not use hand instruments with facility, use this machine to great disadvantage. Dental students should not

be allowed to use it. They should be taught to use their fingers; hand instruments are what they ought to learn with, and they ought also to learn how to make them. I cannot agree with Dr. Brockway that the engine can be used with the same delicacy with which we use our hand-instruments.

With regard to the rubber dam, I do not have anything like the use for it that the paper speaks of, and that many others do. I can keep nearly all cavities dry with the napkin, and it is a great deal more pleasant to the patient, in many respects. I would use such appliances as are the best, without much regard to the views and feelings of patients.

While it is certainly very important to keep the cavity and the work dry, I consider it more important and imperative that the gold or tin should be accurately placed, united, and packed.

With regard to the time Dr. Brockway requires for each cavity: I have filled a great many teeth, and I think that I fill teeth rapidly, but I cannot average fifteen minutes; I cannot average half an hour. I can fill a great many of the cavities that we meet with in fifteen minutes, but many will require an hour and a half or two hours, and some even more.

I believe that a great deal too much or unnecessary time is spent upon plain cavities. This has mostly come from the use of the more modern appliances; perhaps many dentists often feel that they must use them because the manufacturer recommends them and they have them, or because some dentist of great notoriety uses them. I am very glad to have some one speak up for more rapid working; it is due to our patients and to ourselves as well.

Dr. J. W. Clowes. If there is anything in which the dental profession is lacking, it is in saving teeth; and when I hear one of our professional brethren talking about filling teeth in this rapid manner, I am frightened. I hardly know how to express myself. I am seeing work done almost every day that requires a great deal more time than that; and it is a rare thing that I see good work. Is it possible that anybody is able to do good work in the few minutes that the doctor gives as his average? Dr. Hill may have the same power as Dr. Brockway; but, my soul and body! just think what an endowment that is! Why, I struggle and work over a filling from half an hour to an hour, and on some fillings two or three times that. I do not want to spend time unnecessarily, but I cannot put a filling in after that rapid fashion. I see day after day, month after month, and year after year, a great deal of dentistry, but very little salvation. God help the people when there is so little good dentistry and so little salvation! If I were to be called before a court of justice this day and the question were put to me, "Sir, does the profession of dentistry save or destroy

more teeth by what it does?" I would say, "I have to answer the truth; it ruins more teeth than it saves." We must not learn to do our work fast—to do a great deal in a few minutes; we must learn to do our work well. That is the great need of this profession. There are few human mouths that have been in a dentist's care but that bear witness to what I say.

In regard to the application of the rubber dam, it is, I think, one of the greatest blessings, if properly understood and used, that the profession has ever had. But I do not see the necessity of having a great number of traps to assist in its use. I think I used it the first time that it was ever used in this city—a piece about five inches long, and a little wider than my hand; I cut the holes with my scissors, and I have so used the rubber dam from that day to this.

Dr. W. H. Atkinson. It has been remarked that we differ, and I thank God that we do. Some of the arguments we have heard here to-night are dignified beyond their worth to call them arguments at all. To say that any one can cut a hole in a piece of rubber with a pair of scissors that shall compare with the punched hole is absurdity itself. Any one who understands the tendency of rubber to tear can see that at once. I am perfectly astounded at Dr. Clowes's statement, after doing for the profession what he has done with respect to the rubber dam. I can almost indorse every single comma of the paper read by Dr. Brockway. As I understand the paper, it is the best thing I ever heard presented to any society upon the subject of appliances; and it is so in accord with the laws of nature that I am astonished that a physicist, of any intelligence at all, should have the hardihood to stand up before so intelligent a body as this society, and make such assertions as have been made with respect to the use of mechanical appliances in filling teeth. It would do, however, for an operator gifted with the delicate manipulation of Dr. Lord to lay aside many of these things which other dentists find essential in their practice. But to say that an instrument moved by such a machine as the dental engine cannot be used as delicately as the instrument in the hand of the operator does not seem to me to be correct. I cannot, myself, work as delicately with a hand instrument as with an instrument driven by the dental engine. For delicacy, ease, rapidity, and accuracy, I think it surpasses the fingers. I either do not understand the principles of nature, or I have spoken the truth, essentially, with regard to these things.

As to the use of these appliances by students, I would not care if the student had never seen an old-fashioned excavator. I would put the pupil in a laboratory, and give him a tooth or so out of the mouth, and let him work away at it with the machine, and I have never had a pupil who has taken the whole course with me that has done bad work. It is because the colleges will not do that thing, and require it before

they graduate pupils, that we have such a proportion of bad operators, and such a lack of "salvation."

Dr. Clowes has made a startling statement in regard to the use the profession has been to mankind, and I cannot allow it to pass without entering my protest against such statements. I cannot believe that the progress of the profession in the last twenty-five years, over that of the preceding twenty-five years, has not been great—has not been wonderfully great. Is this statement true? Is the conclusion to which the doctor has arrived just? Is it true that the profession is such a lamentable failure as he speaks of? If you will take the portraits of the past and of the present,—the portraits of individuals of any time prior to fifty years ago, and then from that time up to the present,—to what will you attribute the beautiful expression of the present time as compared with the past? I attribute it to improvement in dental science, and I believe it can be attributed to nothing else. I admit that much of what the doctor says is true, if we include in the profession the traveling "injun-rubber man," who goes around under the name of a dentist. I do not believe there is one in this room who has been as bold as I have been in endeavoring to save teeth. I have undertaken to do things that I would not do now, with my better understanding. But to say that dentistry has been an evil, I would have to be an atheist. I would have to go back on the Divine Economy. I have too much faith in the accomplishments of the next twenty-five years, in view of what has been done in the last twenty-five years, to feel that it has been a curse rather than a blessing to the human race.

Sometimes we come to a conclusion without sufficient warrant. I do not want to charge any man with jumping at a conclusion, nor do I want to condemn myself by repeating the same folly, but I wish that all men knew as well what they were talking about, when they are talking of the rubber dam and these other appliances, as Dr. Brockway does. The way that it impresses me is, that I would have him do the work for myself and my friends in preference to any man that would take issue with him in one of his positions. I do not take issue with his position with reference to the time, and it depends upon his statement, because he is a credible witness and the only witness in court; and I have to allow that, as a matter of belief and not of knowledge, I am very much inclined to accept it for this reason: that what used to cost Dr. Butler and myself two or three days to do, my son and I will now do in from three-quarters of an hour to an hour and a half,—viz., to pack an eighth of gold in a tooth that requires that amount. When I was using No. 2 foil, and had no rubber dam, but was using napkins and such appliances, several times has it taken us over two days to fill such a tooth. And how did we do it? By melting some wax on the partially-filled tooth, and leaving it when we

got so tired that we could not work longer, and letting the patient go until the next day; and so on with our thin No. 2, until we had filled the cavity.

Dr. W. H. Dwinelle. It does not matter so much how we arrive at results, so long as we reach them in their perfection. Scarcely any two operators operate alike, but there are certain general principles underlying all operations which must be observed. I do not like to hear disparaging remarks carelessly made upon the progress and the status of our profession, but, where there is room for criticism, we should bear it patiently. On the whole, I think our profession has made progress which we should justly recognize. My experience has not been precisely like that of Dr. Clowes. I have seen a great deal of good work. I think that the last fifty years has been a period of great triumph for our profession. I think the facial organization has been vastly improved, and its improvement is attributable to the advancement made in dental science. I look forward to the next fifty years, or the next one hundred years, as the period of still greater progress in that direction. We ought to judge by the good results rather than the bad. Whenever a person has produced good results, that is a harbinger, and a true one, that the same thing can be done again; not only that it can be done again, but it can be done better than it was the first time. I cannot allow that our profession is a comparative failure. I do not agree in the statement that there are teeth in the mouth that, of necessity, cannot be saved with gold. The gentleman who made the remark referred to wisdom-teeth especially. I will show him wisdom-teeth without number that have been filled with gold successfully, and are in the mouth to-day, that were filled thirty and thirty-five years ago. In my own mouth there are crowns that were built up thirty-three and thirty-four years ago, and they are in good condition to-day. I have others that have been built up recently, and I have been perfectly willing to sit in my chair and take the same medicine which I administer to others.

With regard to the rubber dam, it may be a little vanity in me to say that I was something of a pioneer in reference to appliances for unusually difficult operations. I have found the rubber dam essential in filling large cavities with gold. It should be used and not abused; it is not for constant use, but it was intended as a magnificent auxiliary. I use the napkin now as often as I did twenty years ago, but there are many cases where the napkin would be of no avail.

Dr. B. R. McGregor, Rochester. I have listened to these discussions with the usual interest to which I listen to all the utterances from your society. You can not over-estimate the value of your discussions to the country dentists throughout the land. Every one of us feels obliged to you. If it were possible to add anything to the force of the

discussions and the paper by Dr. Brockway, which preceded them, it would be perhaps to quote an idea, amounting to an aphorism, in the "Fine Arts," by Ruskin, viz., "That whatever is well done is usually easily and quickly done, and has more of the characteristics of recreation than of labor."

In regard to the use of the rubber dam, as described by Dr. Brockway this evening, it would almost seem incredible to me if I had not witnessed the application of it, with the aid of an assistant, in the space of time he describes. I am, therefore, prepared to believe anything that can be mentioned in its favor. I only regret that the doctor has not described to us his method of using the dam in the buccal cavities of molar teeth, where the decay rises much above the edge of the gum.

Dr. A. H. Brockway. I insert a couple of gold screws at the upper margin of the cavity, carry up the rubber and hook it over the screws; then I fill the cavity and finish screws and filling off together.

Dr. O. E. Hill. I do not like to let Dr. Clowes down easy on his assertion that dentists do more harm than good. He professes to be surprised at Dr. Brockway's assertions. He ought to be still more surprised at his own. It is more radical and impossible of belief than anything that Dr. Brockway has said or written. I do not like to have any member of this association make such statements to be recorded and published.

Dr. Clowes. It is necessary I should say something more, because this is a very serious matter. What alarmed me was Dr. Brockway making his statement of filling cavities on an average of fifteen minutes. He may be perfectly competent to do that, but I am sure the profession generally is not. Gentlemen, as I understand it, the young men that are in the colleges—and that is where a great deal of mischief is being done—are taught to perform operations *rapidly*. The professors aim to do the work quickly, and so lead on their students. I saw in a patient's mouth, yesterday, work done by one of the most distinguished professors in one of the colleges in this country. The patient said he was such a *rapid* worker. His drill had gone through the root of one of the teeth he had filled. What I fear in our profession is that quick work will be done at the expense of good work.

Dr. A. H. Brockway. I tried to make the point in my paper that the difference in the time occupied in operations by different dentists might be largely accounted for by the different manner of using the various appliances. Dr. Clowes says he cuts holes in the rubber dam with the scissors, and he never has found any necessity for these appliances that I have spoken of using. It is impossible to cut holes with scissors rapidly and perfectly; consequently, it is impossible for him to adjust the dam in as short a time as he could do if prepared by these other means. He does not employ system to aid him. It is just so in

the use of the engine. I am as anxious that work should be done perfectly as any one, and, perhaps, may be permitted to say that I do save a reasonable number of teeth that come under my care. I could not do as I do without the engine and the dam. I worked fifteen years without them, and I have worked for nine or ten years with them, and I would no more think of continuing practice without their aid than I should with the loss of one of my hands.

Adjourned.

AMERICAN DENTAL ASSOCIATION.—SIXTEENTH ANNUAL
SESSION.

(Continued from page 601.)

SECOND DAY.—*Morning Session, concluded.*

A VOLUNTEER paper on the Transplantation of Teeth, written by Dr. W. N. Morrison, was read by Dr. Shepard.

This paper opened by stating that all the cases reported to this body last year are firm in their places and doing good service, with one exception, that being in the mouth of Dr. L. C. Ingersoll, which was loosened by an unlucky jar upon a cherry-pit. The paper then reported other cases, of which the following are the most interesting: No. 41, young lady, aged twenty; superior bicuspid; periosteal trouble. Tooth extracted, refilled, and owing to fracture of the buccal wall (which was very thin) in the operation, it was finished up as a cuspid, and the palatal wall turned to the buccal side of the socket in replanting. No. 48, right lower molar, amalgam filling in distal surface difficult of access; tooth giving trouble. It was extracted, and the patient left. Next morning she returned to have other work done, and the extracted tooth, which had been cleansed and filled meantime, was returned to its socket. No. 40, lower wisdom-tooth, or rather roots. The patient's sister had a wisdom-tooth for which there was scarcely any room; the roots were extracted, and also the wisdom-tooth from the mouth of the sister, the root cleansed and filled; but it being large and tapering, it became necessary to remove the septum and prepare the socket for its reception, which was done, and the tooth transplanted; the articulation was good, the tooth soon became firm, and to-day is a splendid masticator. No. 57, healthy young man, first and second lower molars badly decayed, pulps dead, and face much swollen, and hard. The teeth were extracted and filled,—being kept out of the mouth about twenty-six hours,—and replaced. One month afterward they were doing good service. The writer stated that he had a great number of interesting cases which he had not reported.

The subject of Operative Dentistry was then opened for discussion.

Dr. James Leslie, of Cincinnati, said that he was the original intro-

ducer of cohesive gold, in 1839. At that time there were no journals to tell of the discovery; if there had been, it would have been done. There were witnesses present who can testify to these facts. Dr. H. N. Klutt, then of Louisville, Ky., was the first person who restored the contour of a tooth with cohesive gold, at the suggestion of the speaker. This form of gold has got a black eye at the present time, but it will yet get over it. It has failed on account of the use of the mallet. There has been too much hammering. The gold becomes hard by beating, and the quality of cohesion is impaired by repeated and long-continued hammering. The surroundings of the tooth are shaken, the fillings are shaken, and there is weakness throughout the whole mass. The life of the metal has been malleted out. It must be remembered that pressure does not *condense* gold, it merely drives out the contained atmosphere, and beyond that point the metal is injured. There is too much hammering, and too small points are used. In one case a tooth had received four thousand taps, when the patient ceased counting.

Dr. W. H. Allen, of New York, wished to corroborate all that the last speaker has said.

Dr. Leslie being asked whether he could reduce cohesive gold to non-cohesive, replied that he could take both forms of gold and manipulate them a little, and one could not be told from the other. The only difference that he knew of is, that there is something on the surface of the non-cohesive gold that prevents it from adhering. Why it should go up to the walls of the cavity better he could not tell.

Dr. Kingsbury, of Philadelphia, said that he was gratified at Dr. Leslie's remarks, and agreed with most that had been said. It is easy to solve the question why soft foil can be better adapted to the walls. Cohesive gold is less ductile or soft, and invariably has more or less rigidity, and of course it cannot be so well adapted to the walls. He was glad that Dr. Leslie had thrown a wet blanket on malleting; he had seen instances corroborating his assertions. It is not necessary that foil should be pure in order to cohere. He had some now in his office, which contained silver, and is very cohesive.

Dr. Barker, of Philadelphia, said that it had been claimed by an eminent chemist that no amount of pressure alone would overcome filmal resistance and cause gold to adhere; it was necessary to have a blow or shock. If this was true, it was an argument in favor of the electric mallet.

Dr. Wetherbee, of Boston, said that although cohesive gold is called hard, it is not hard, but is the softest possible condition of gold. It has obtained this appellation because it coheres or clings, and there is greater resistance in using it. He takes issue with the opinion that this form of gold cannot be adapted to the walls, and claims that it can be in all cases. It is, however, requisite that one should know how to

commence and to carry on the process. When the dam can be used, all cavities can be filled as successfully with this foil as with soft. Failures at the buccal or cervical margins are not owing to the cohesive foil, but because the filling has become loosened by too severe malleting; the dentine has been bruised. The filling may be tight, but the door to decay has been left open. Cohesive gold does not require a large amount of malleting; the less the better. If men have not brains enough to use it successfully, they had better bid adieu to the profession and find some other calling. It may, and can be, used successfully. He has no trouble. His fillings stand as long at the cervical margins as at any other point; but he is very tender of the walls. The cry is rolling down the Delaware and down the Mississippi, "Away with cohesive gold!" but he defied a demonstration that soft gold can be more perfectly adapted to the walls. Time may be saved, but in a majority of cases a contrast in perfection is manifest, and therefore that claim falls to the ground.

Dr. Shepard, of Boston, thinks it can be demonstrated that soft gold can be better adapted to the walls. The terms cohesive and adhesive are used loosely; the former is that which should be applied to gold; it signifies sticking together, or to itself; *adhere* is to stick *to*. Clean foil will cohere; non-cohesive has something on its surface preventing union. When cohesive foil freshly annealed is rolled into a rope there is an irregular contact of various surfaces at innumerable points; the more it is rolled the stiffer the rope becomes. There is union and cohesion at those points; innumerable arches are formed, which cannot be broken down. For this reason the foil cannot be so well adapted to the walls, when it is used in any quantity; very small masses may be adapted to the wall. Cohesive foil, though called hard, is the softest in the world, when not in arches and curves.

Dr. Flagg, of Philadelphia, uses large quantities of foil, and, except when making large contour fillings, uses soft. Experience shows that plugs of twenty or more years' duration are still in good condition, and it is not likely they will deteriorate much hereafter; what more do patients want? He had filled a tooth at Cincinnati, ten years ago, in one minute and fifty-eight seconds, that he believed was still in good condition. Proximate cavities require cohesive foil and gentle manipulation, and with care a good filling can be made. The dentine should not be hammered. It is not necessary to hammer so much.

Dr. Morgan, of Tennessee, said that he commended both of the papers, so far as he understood them, but thought Dr. Abbott drew a dark picture of cohesive foil. He would caution men not to get upon hobbies. Getting up was easy enough, but getting down was difficult. Cohesive gold is soft,—softer than non-cohesive. There is something upon the surface of non-cohesive gold. Dr. Shepard's illustration had

proved that gold never ought to be used in the form of a rope, but should always be folded or laminated. Used in strips or squares, these arches and angles were avoided. Cohesive gold had been used in Europe, in 1845 or 1846. No new principle had been discovered in regard to gold in the last fifty or one hundred years. Every mode now used was used long ago.

Dr. Stellwagen, of Philadelphia, said that this subject is discussed yearly, and men as often change their views. This means that a good filling can be put in, one which will last for years, of both kinds of foil; but in some cases one kind is superior to the other. Abbey's soft foil cannot be made cohesive, yet fillings of it have lasted for decades. It is always uniform, and a smaller percentage is wasted in his hands than of any other kind. The fewer manipulations we make the better, if we succeed in preserving the dental organs. If dentistry was always to be done in one way, it would not be necessary to have such intelligent men to practice it. What makes it a profession is that the judgment is called into play. One man is carried to the top ranks by the use of one kind of foil, and another by a different practice. The specific usefulness of both kinds ought to be universally recognized.

Dr. Hunt, of Washington, said that while there is a great difference of opinion on all subjects, there was too much assertion and too little proof. Fillings of non-cohesive gold have done service as long as any fillings; successful fillings have been put in with all kinds of gold,—but their differences must be understood and the requisite manipulations followed. There is no effect without a cause; there are unvarying natural laws, and if we lose sight of these facts we go astray; if we do not work in accordance with law, we make imperfect operations. Our object should be to discover these principles and laws. Can we do it by jumping to conclusions? There is no way except to investigate, and take into account every cause. Then, and not till then, we can draw conclusions. The time will come when we shall understand cohesion, but we do not now. We must collect and collate facts, and then build our theories. The reason for differences of opinion is that we do not take into account all the causes; and also, that there is more than one way of accomplishing the same end. That the end may be accomplished with cohesive gold does not prove that it may not be with non-cohesive. A conservative liberality should prevail.

Dr. Barker, of Philadelphia. There is much truth in all that has been said. We become partisans, and say that men are making failures because we can't do what they can. It is the *man* behind the instrument and the gold, that does the work. All the different methods can be made successful. He has made microscopic sections of fillings made with both varieties of gold, and had yet to detect any difference. A tooth may be replaced and retained after extraction, even if it has been

polished, provided scar-tissue holds it there, without union. Every man who reinserts a tooth takes a fearful risk, a risk which he (the speaker), for one, will not take, after the experience he has had. When a man has stood as he has, by the bedside of a patient who has had seven teeth successfully removed and reinserted for the cure of an otherwise incurable disease (osseous deposit in the pulp-cavities and upon the roots), an operation which resulted in the patient's having retained those teeth with comfort for seven years; and then when one more is removed have tetanus set in, and carry off the patient, after days and nights of agonizing suffering, the body being at times bent into a perfect arch, and so stiff that it could not be broken any more than if it had been made of iron; when a man has seen such a result as this follow this operation, he will be cautious how he runs such a risk, simply that it may be known that he is in the front rank. There is great danger of tetanus in the operation of torsion.

The speaker then described a method of elongating a central incisor which had been broken off, by means of ligatures, illustrating his remarks by diagrams upon the blackboard.

Adjourned.

Afternoon Session.

The subject of Operative Dentistry was still under discussion.

Dr. McDonnell agreed with Dr. Barker, that as much depends on the tooth-material as on the operator. A filling might be inserted successfully in a marble slab that would not last in the mouth. Mournful failures occur to the best men; they see that they have thrown away their time and efforts; but they had in these cases failed to recognize that that tooth was not amenable to preservation with gold. There is a class of teeth of that character. He asserts that amalgam may be better than gold under the best hands. There is too much malleting of teeth, and more teeth are destroyed by it than by failures of fillings. He uses the mallet, but not as extensively as formerly. A bridge cannot be anchored on a quicksand, neither can skill and gold save all teeth; more teeth would be saved if more judgment was used. Gold must be inserted on a rock; our failures discredit the status of dentistry. He approved of the action looking toward the establishment of a section which should endeavor to discover some means of preventing decay after filling. Dentists should select brushes and keep them on hand, and inform patients of the importance of cleanliness.

Dr. Barker said that there was a difference between transplantation and replantation; the latter is admissible and advisable under certain circumstances; but drainage must be provided for; unless that is done the operation will be attended with danger. Referring to the case of elongation illustrated in the morning, he said that, if attempted, it should

be with very light tubing; motion, even normal motion, must be prevented, and consolidation must take place thoroughly and well. A tooth can be driven back into its socket, even though the patient is fifty or sixty years of age.

Dr. Stellwagen exhibited a cock, in the comb of which a bicuspid tooth was growing, having been transplanted. It was out of the mouth four hours before insertion in the comb. He claimed that there is danger of tetanus in ordinary dental operations, such as wedging teeth, inserting gold fillings, and capping pulps,—though the chances of this were small. Dr. Barker's patient (alluded to this morning) had placed herself in a pathological condition by fasting and religious observances, which, in connection with the local pathological condition, was sufficient to produce the result. We must judge when danger is liable to occur. In the lower grades of operations there is not so much danger; that of transplantation is no more dangerous than many other surgical operations. It is justifiable in certain cases. His experience with it had been satisfactory; the results had been permanent; he had known of teeth so treated lasting eighteen or twenty years. Articulate speech was the boon for which he pleaded. He had transplanted teeth from the mouth of the mother to that of the daughter.

Dr. J. G. Ambler, of New York. All kinds of gold have had their advocates. All who have been in practice have witnessed many changes in this respect. The advocates of cohesive gold, and also of non-cohesive, are right; but to say that either should be used exclusively would be wrong. We cannot fill an egg-shell with the same material as a cavity in a solid substance. Cohesive gold, though soft, is harsh in angular positions. Each is good in its place, and the operator must be the judge. He had known of a case of transplanting under unfavorable circumstances which had proved a success, and was firm in the socket at the end of three years.

Dr. Taft. This operation is of great value to us, and teaches us a lesson as to the ability of nature to repair. All its importance does not attach to the mere fact of removing and replanting. In cases where the tissue is thickened, the tooth may be extracted, the thickened tissue removed, and the tooth replaced with success. It is also a favorable and prompt method of treating alveolar abscess. It is more applicable, however, to teeth of single roots, though it may be done in others, when no breakage occurs. In replacing, the roots, if divergent, might be cut off; the cementum might be scraped when necessary. Even where the walls of the sockets have been removed, they are sometimes reproduced and the tooth is made firm. He knew of a case where the outer plate was removed and the inner one was affected, the teeth being quite loose; entire restoration was made, and a bony wall was built up which stood well. It is a secondary material, but nature often repairs to last

as long as life endures. In the treatment of neuralgia, especially when caused by hypertrophy, this plan may be valuable. In one case, when apparently no disease could be found, there was a slight uneasiness under percussion, and the pain seemed to start from a certain tooth. Upon removal it was found considerably hypertrophied, but there was no decay; the hypertrophy was scraped off, and the tooth replaced, and not a twinge of neuralgia had been felt since. The soreness had passed away in three or four days. In another case of abscess of the inferior bicuspid, with an external fistulous opening, accompanied with depression of the cheek, the tooth was removed, and the filling (on the posterior surface) taken out; the pulp, which was probably dead when filled, was extirpated, the root cleansed and filled, and the tooth, after being dipped into a solution of phénol-sodique, was replaced after being out fifty minutes. It was sore for a few days, but not much, and had since been used for mastication, having become firm. The fistulous opening had healed in a few days. The patient was directed to place his finger inside the cheek and draw it outward frequently, and now no depression of the cheek can be detected. It is two or three months since the operation. The question had been asked whether pulps can be restored after this operation. They can be. He had removed a lower bicuspid by mistake thirty-two or thirty-three years ago, and replaced it. Last fall the tooth was examined, and there being imperfection in the crown fissures, it was cut into and found to be sensitive, showing that the pulp was alive. In this case there was no tooth behind to support this one. The tooth must be held firm to allow the plasma to adjust itself and become organized. Antiseptics should be used, the clots removed from the socket, and the nutritive functions attended to.

Dr. Barker did not believe that the pulp was really restored, and asked how it was known that it had been.

Dr. Sturgiss, of Illinois. We have to change our practices and retrace extreme steps. He had learned from cohesive-foil men, and had used all kinds of mallets. He could not use soft foil all the time, but except for contour fillings can make better work with it. Is satisfied that both kinds are indispensable. The soft foil should be allowed to project out of the cavity, and the edges should be riveted down afterward. It makes little difference how the center is, if the margins are perfect. He had tried replanting and had had to extract afterward; found it produced abscess. We should save a living member alive if possible, for when we have a dead one we have a poor thing.

Dr. Field inquired as to the success of a case which he had seen while in Dr. Morrison's office in St. Louis; the patient had left her tooth to be filled and gone shopping, and had afterwards returned for it. If these things can be done successfully, it is a wonderful revolution in dentistry.

Dr. Morrison replied that the operation was a perfect success. He had operated upon about one hundred teeth in this manner; had had no tetanus, and had only lost two or three.

Dr. Atkinson. Both papers are worthy of investigation. If they had less of assumption they would be better. Prejudice has taken control of us; we regard the first blush as the final solution. There is a point where all function has a beginning, and when it has accomplished its purpose it is finished. What constitutes cohesion and non-cohesion of gold? Skinless bodies coalesce; soft gold does not cohere because it has a skin or pellicle upon the surface. Give us good work by any process, but don't force us to conclusions as to how it is accomplished till you can justify them. He accounts for the success of replantation by the skinlessness of the extracted teeth. All reproduction follows the same rôle,—you must have a pocket or uterus. He could give hosts of cases of rapid cure of abscess. Dr. Abbott's paper is valuable as a review to those that did not know its contents before; it was a marvel that Hunter should know as much as he did, not having any dissections. His conclusions were very sound; his practice was more deficient than his principles. He (Hunter) had performed the operation of transplanting a tooth into a cock's comb. This simply shows that points that are plastic and skinless unite. The other paper was clear-headed and warm-hearted; the author appreciates principles more nearly than any other one that has presented a paper.

Dr. Thomas, of Detroit, mentioned a case of replantation of inferior second bicuspid. It was placed in a glass of water with a little alcohol; the abscess was cut off, root cleansed and filled with Hill's stopping, and the cavity of decay with amalgam, the socket cleansed and tooth replaced. There was slight soreness for three or four days, but in a week it was all right and continued so.

Dr. Corydon Palmer. When you have simply filled a tooth you have only done what any jeweler could have done, and done better. There is more difference between cohesive and non-cohesive foil than simply a pellicle on the surface; soft foil does not harden under the instrument. The repeated heating of the foil reduces the cohesive quality. It may be damaged by too much handling. Anything can be done with cohesive foil that can be done with soft, and a great deal more. [Dr. Palmer made some extended remarks, but they were inaudible at the reporter's table, and are consequently necessarily omitted.—REPORTER.]

After some miscellaneous business the meeting adjourned.

(To be continued.)

AMERICAN DENTAL CONVENTION.—TWENTY-SECOND ANNUAL SESSION.

(Continued from page 608.)

SECOND DAY—*Evening Session.*

DISCUSSION of the third topic of the president's address was declared in order, viz.: Should a dental diploma signify that its bearer has pursued his profession a certain length of time, or that he has acquired a certain proficiency?

Dr. Walker said the country is flooded with men who have diplomas which signify nothing, because the work which these men do is not worthy of graduates. The way to have a diploma mean something is to have it express a fixed idea. Shall this idea be that he has been through a dental college, or that he is competent to practice dentistry? It should be competent evidence that its possessor is worthy.

Dr. Ambler. Qualification is the thing to be considered; length of time is nothing. The diploma should state the qualification of the possessor, otherwise it is of no value. There can be but one opinion on this question.

Dr. Hunt. The question is, Shall one who is competent and acquires knowledge rapidly be required to spend a certain definite length of time without regard to his acquirements prior or present? Should colleges keep the student after he deserves a diploma? There is only one way to decide that. The true plan is to examine him, and when he is qualified he ought to have his diploma, be it in two or five years. The question of a minimum time has been discussed, and the impression is that there should be two full courses.

Dr. Pettit. Gentlemen take a one-sided view of the matter. Diplomas should express both a fixed course and a certain time. Any other basis is likely to be incomplete; a student might, by good luck, pass when he was not qualified. It is impossible for any faculty to examine candidates thoroughly; a physician might pass a better examination than a dental student, but he would have a theoretical rather than a practical knowledge.

Prof. Winder. Granting that ordinarily a student would require two courses, should there be no rules for the exceptions? Is it the object of colleges to keep students in the building and before the professors, or to give them their diploma when deserved? He had conversed with President Gilman of the Johns Hopkins University in Baltimore, and he had expressed the opinion that the time had passed when the interests of classes should be looked after, but rather the interests of the individual should be subserved. That institution would grant diplomas whenever deserved. The University of Virginia grants but one degree, and that upon merit, and merit alone.

Dr. Walker said he did not care when, where, or how the student

obtained his information ; it might be in forty minutes, by inspiration, or it might be forty years, and if he had studied that long and was not competent, he would not let him have the diploma.

Dr. Allen. There are those who have obtained diplomas, who are content to settle down and make no further progress. They do not prove themselves thinking and meritorious men. Graduation is only the starting point, and a man must educate himself after that. If he is qualified, it matters not how the knowledge is obtained. With a double examination (before the professors and trustees) it would seem hardly possible that he should pass if not qualified. Every school should enforce it upon the mind of the pupil that his work is not done when he gets through. Onward and onward is the word in our profession, and he does not know the man who has reached its highest point.

Dr. Pettit. A diploma should be evidence that its possessor is fitted to practice. One session is enough if the student has had sufficient experience. It is not possible for the professors to examine a man on every point on which he should be posted.

Dr. Winder. There is no school in the world that grants diplomas after a given time only, except the medical schools of the United States. All literary institutions recognize the principle that a man should be given credit for the amount of knowledge he may have when he enters. If he can come up to the standard he can graduate in one year.

Dr. Hunt. In the examination the student should be able to come up to the required standard. If a student showed himself proficient in medical knowledge, he should be more thoroughly examined in dentistry than otherwise. The diploma should mean what it says.

Dr. Reynolds is surprised at the deficient preliminary education shown by many good operators, as evidenced in letters he had received.

Dr. Keely, of Ohio. Commencement is only the beginning. Too many lay aside their books when they leave college. He had always been satisfied of the good moral character of a student before he would take him, and he exacts a pledge from them that they will attend a dental college. It would be unfair to require a man to take two courses who was competent to graduate in one. It is pretty hard for a man to gain all the necessary information in two years. A young man should pass a certain time under a preceptor before going to a college ; the short-time process is one of cramming from beginning to end.

Prof. Coy. This subject cannot be passed lightly. If a man is qualified to enter college, let him enter, and when qualified to go out let him go out. Some men will learn more in five minutes than others in a week. Why should such a one be compelled to listen to lectures ? The colleges who maintain this doctrine are not present to defend themselves, and the case goes against them by default. If men are not to be educated in a college, where shall they be ? Certainly not in an

office. He cannot and will not take a student, and there are many others who will not.

Dr. James Leslie. In the Ohio College no demand is made for a preliminary dental education; the student must possess a fair English education and a good moral character. He does not think that any young man can be qualified to practice in one session. No young man should graduate unless he can make a gold plate. It would require almost a whole session to become familiar with continuous-gum. It is a mistake to think that because a man can put in a good filling he is a dentist. Even well-posted practitioners are benefited by colleges. In Ohio a man can go before the board of examiners and receive a certificate of qualification, but no young man can begin practice without either a certificate or a diploma. The professors should be faithful, and not recommend candidates unless competent.

Dr. Williams wishes to emphasize Prof. Winder's position. It is hard for a faculty to deny the diploma when a student has gone through the regular routine, although their better sense would say he was not entitled to it. The establishment of examination by a board of regents inaugurates a new era in giving diplomas. He knows of men who go to towns and advertise themselves as graduates of colleges, and do work which is not honest work. Striplings may gain admission to colleges, who have mere mercenary motives. He knows of one man who has been only six years in practice, yet has a dental family as large as that of Jacob!

Dr. Keely said the law in Ohio had the effect to make men who fail try again and again; he gave an instance where a man who had been rejected once or twice finally passed with credit.

The fourth subject—Who shall confer the dental diploma?—was then taken up.

Dr. Walker. Diplomas have been conferred by those who have a personal interest in the matter. To be certain that they are properly conferred it should be done by a board of regents, who have no personal interest at stake, and no bias.

Dr. Hunt. We are so well satisfied with the workings of the plan that we hardly see the need of arguments on the subject. There are unworthy graduates of all institutions, medical, dental, and legal. To guard against this this plan was adopted, and all say that it is one of the things that is wanted. It throws a guard around the door by which the candidate passes out, and there cannot be too many safeguards around that door.

Business was then suspended to hear a paper from Dr. J. G. Ambler, of which the following is a synopsis:

Dr. Ambler's paper attempted to answer the question, "How can I best advance the interests and add to the reputation of my profession?"

It could be done by remembering that it is the individual that gives dignity to his calling, not the calling to the man; by an honest discharge of its duties, by being master of it, and being satisfied with nothing short of perfection. Our profession suffers from the unskillful operations and unprofessional conduct of its members. An honest and just life, coupled with skill and sympathy, will raise the individual in the scale of appreciation, and his calling with him. The recognition and appreciation of discoveries, and the efforts of those who devote time to them, and an endeavor to imitate their example, are means of adding to the reputation of the profession. We should frown upon that selfish spirit which would conceal and retain improvements in methods of practice; still being willing to render an equivalent, when it is due. We should identify ourselves with organizations calculated to bring the profession together for the interchange of views, and should contribute to and sustain journals devoted to our calling. By aiding in surrounding the profession with safeguards, to protect it from empiricism, as well as encouraging all efforts for its advancement, we shall add to the status of our profession.

On behalf of the convention, Dr. Ambler then addressed Dr. John Allen, of New York, and presented to him a suitable testimonial, for his efforts to advance the profession. Addressing Dr. Allen, the speaker said that his struggles in this behalf had been witnessed with admiration by his brethren; and we pride ourselves upon the fact that other nations have shown their appreciation of his efforts, by awards previously unknown in that specialty. These have been of gold, silver, and bronze, and the employment of a new material in this instance seeming to be desirable, platina had been selected, as being identified with the improvements of Dr. Allen; and in order to connect it with this centennial year, the medal has been ornamented with a representation of Memorial Hall; on the reverse was the name of Dr. Allen, and by whom presented, with the motto, "*per angusta ad augusta*" (through struggles to triumph). The medal was about one and a quarter inches in diameter.

Dr. Allen replied in a few well-chosen words.

Adjourned.

(To be continued.)

PENNSYLVANIA STATE DENTAL SOCIETY.

(Concluded from page 612.)

ABSTRACT OF PAPERS AND DISCUSSIONS.

NEURALGIA,—ITS RELATION TO DENTAL IRRITATION.

PROF. J. H. MCQUILLEN delivered an address upon this subject. He said that in the derivation of the term neuralgia (*neuros*, a nerve, and *algos*, pain) we have its meaning defined. It is a term not infrequently

employed to conceal the ignorance of the practitioner, both dental and medical. Pain sends us most of our patients; it has been looked upon as a curse, but is really a blessing, for it is a most valuable means of diagnosis. A reputation as an accurate diagnostician renders a practitioner both prominent and useful; without it he is a mere mechanic. In considering this subject, the anatomy and physiology of the nervous system must be understood, for it is through this that sensation exists. It is supposed that in the lower orders this sensation is low. In the vertebrata the cerebro-spinal portion of the nervous system is that through which sensation is had. Through the same medium come both pain and pleasure, and the latter is a compensation for the former. The cerebro-spinal nervous system consists of a large nervous mass, an upward prolongation of the spinal cord, and apparently arising from it are thirty-one pairs of nerves, each having what are known as sensory and motor roots. There are besides twelve pairs of cranial nerves, and what is known as the fifth pair of these is the subject of these remarks. This nerve arises by anterior and posterior roots; the posterior root having its origin in some forty fasciculi in the medulla oblongata, while the anterior arises from the corpus pyramidale. This latter passing forward eventually expands into the ganglion of Gasser. Starting from this ganglion are three important branches, the ophthalmic, and the superior and inferior maxillary branches. The ophthalmic branch arises from the upper angle of the ganglion, and passes through the sphenoidal fissure into the orbit, there dividing into several branches; the superior maxillary branch arises from the middle of the ganglion, passes through the foramen rotundum, and enters the canal in the floor of the orbit, along which it runs to the infraorbital foramen. Three branches of the superior maxillary are distributed to the teeth of the upper jaw. The inferior maxillary branch comes from the lower part of the ganglion and passes through the foramen ovale, the motor and sensory roots uniting at the otic ganglion; after which the nerve divides into two branches, the external and internal, the former of which sends five branches to the muscles of mastication, while the latter and larger divides into several branches, the auriculo-temporal, the lingual, and the inferior dental, the latter of which passes into the inferior dental canal and is distributed to the lower teeth. The ophthalmic and superior maxillary branches are distributed only to sentient surfaces, such as the forehead, temples, and teeth, while the inferior maxillary, by its union with the motor root, assumes a compound character and gives off a motor branch to the muscles, a branch of special sensibility to the tongue, and a third branch of common sensibility to the teeth and integument of the lower lip and chin. It is the branches of the latter class that claim our attention in their relation to neuralgia, a disease which, though it may manifest itself in any portion of the system,

yet assumes its most horrible form in the head, face, and jaws. The causes of neuralgia are either predisposing or exciting. Persons of a nervous, irritable temperament, as well as the gouty and rheumatic, are most liable to suffer from it. Dyspepsia may also be looked upon as a predisposing cause. Among the exciting causes, malaria is recognized as one of the most potent; exposure to cold and to damp states of the atmosphere may develop it, and after it is once established slight causes may bring on a violent attack. Gastro-intestinal irritation, the presence of indigestible or insufficiently masticated food, or ice cream taken into the stomach, frequently induces an attack. As an illustration of the sympathetic relation existing between different portions of the organism, it may be stated that it is not unusual for a person after eating ice-cream to feel intense pain in the forehead, while the stomach itself apparently suffers no inconvenience. So it has been found that an aneurism causing pressure upon the crural nerve would cause pain, apparently located in the knee, though no cause for it existed there. One of the most common causes of neuralgia is the exposure of a nerve to air, or its compression by a tumor, and this brings it specially within our province, for it is in the teeth that this state of things occurs, by the exposure to air and foreign substances of the dental pulp, developing the most intense suffering. This condition is often treated by the physician as if it had its origin wholly in malaria or some other general exciting cause instead of the actual one. Periodontitis also develops a form of pain that has been denominated false toothache. In what is known as sympathetic toothache, pain is referred by the patient to a perfectly sound tooth, the real cause of trouble being an exposed pulp or periodontitis in some neighboring tooth. The formation of nodules of osteo-dentine in the pulp, and of exostosis of the roots, is productive of the most intense pain, as is also the eruption of either the temporary or the permanent teeth; and being difficult of diagnosis these are often denominated neuralgia. Instances are not wanting to prove the correctness of this position. In one case of a child, two and a half years of age, the physician, concluding that the origin of the paroxysmal pain was malarious, advised mercury and quinine; but a careful examination showed that the second molar was endeavoring to erupt, and an incision being made in the gum, no further trouble was experienced. In another case, a young lad had suffered intense pain for weeks, and the dentist had said that there was nothing about the teeth that could cause it further than a crowded condition, and advised extraction. On examination it was found that a second molar of the lower jaw was partially erupted. Upon lancing it freely, relief was at once obtained, and there was no recurrence of the pain. Other cases of adults who had suffered severely from neuralgic pains were mentioned, the physician, or dentist, having failed to discover the

difficulty. The existence of certain exposed pulps being ascertained, and these being properly treated, the neuralgic symptoms at once disappeared and did not recur. In some of these cases the attending physician had administered quinine, iron, arsenic, morphia, and aconite for weeks without relief.

The most difficult cause of neuralgic symptoms to diagnose and cure is perhaps the existence of pulp-calcification, to which reference has been made. The teeth in such cases are frequently perfectly sound to all appearance.

It is not unusual for neuralgia to have its seat in the branches of the fifth pair just after they leave the ganglion of Gasser; and this, perhaps one of the most trying forms of neuralgia, is due to pressure upon the nerve, as it passes through one of the foramina. Thickening of the periosteum of either of these foramina, thus decreasing the size of the canals and compressing the nerve, becomes sometimes a source of intense suffering only relieved by death. Many of those present, who have been in practice for twenty-five, thirty, or forty years, will bear witness to the truth of the statements which have been made in relation to dental irritation being frequently denominated neuralgia, and in regard to the failure of the medical profession to recognize the cause of trouble. In this city (Philadelphia) there is a lively recognition of the relations between the teeth and the nervous system, and in obscure cases it is the practice of medical men to send their patients to the dentist to ascertain if there is any irritation arising from the dental organism.

Discussion.

Dr. Barker, of Philadelphia. The disease called neuralgia is one of the deepest interest, and one which is calculated to be fearfully increased at the present time. We have seen in the remarks of Dr. McQuillen the relation which the fifth pair of nerves bears to the pain, and also how certain nerves which are distributed all over the body, nerves belonging to the great sympathetic system which control circulation, digestion, and defecation,—how all these come together and coalesce with the nerves of the cerebro-spinal axis. Thus we see how it is that a badly-cooked meal, or chicken salad, taken into an organism which has not the power to assimilate that kind of food, may act as an irritant to the great sympathetic nerve, and in consequence of this coalescence may produce toothache as a result; and not infrequently the patient may fall into the hands of an ignorant dentist, who takes out the tooth, and when he gets it out he says it has got an ulcer on the root, a thing that he (the speaker) had never seen yet. This is a fine point of diagnosis, and we want to be perfectly familiar with the causes that may produce these results; as dentists we must know what is the mat-

ter. An irritated pulp, a defective filling,—and there are plenty of these,—a small covering of bone over a pulp, all will give rise to pain, which is transmitted to the brain through the sensory nerves. We are too ready to say to our patients that they have got neuralgia and must take quinine. We must go deeper than that. Ninety-nine out of every one hundred women have a congested uterine neck, and this is one of the primary causes of neuralgia, and is produced by the almost universal use of the sewing-machine. Another deeper cause is the food. Patients suffering in this way generally say they have a very poor appetite; they are fond of cheese and pickles and chow-chow; in fact, they live on bread and butter and tea and coffee and chow-chow. That magnificent piece of machinery, the Corliss engine, would not run with an oil lamp holding half a pint. Force cannot be produced; it must result from combustion, and that is the reason of this malnutrition, and the reason why we are going to have plenty of bad teeth and of neuralgia in the future.

We want to educate the people at their table, and say to them, you must use certain kinds of food, those which are just as necessary to repair the waste of tissue as the oxygen of the atmosphere. Every one knows that an atmosphere without oxygen will not support life; and we can just as confidently tell people that they are killing their children by allowing them to eat certain articles of food which destroy them or prevent their development. When we do this we shall be performing our duty. At the same time we must not forget to look for all those causes which have been defined by Dr. McQuillen: the irritated pulps and the neuralgia which is not neuralgia at all, but simply the result of defective dental service.

Dr. Magill. It is well known that there is a great difference with regard to nervous sensibility. A horse with a broken leg will stand upon the stump and eat and enjoy his food; the earth-worm when cut in two lives and recovers; the lobster deprived of a claw lives, and the claw is reproduced. Nature works according to laws that are well understood. When we treat all pulps alike and suppose the situations are the same, what errors we shall perpetrate, what injustice will be done to our patients! If we do not understand the situation and regulate our practice according to it and the loss of health, these errors will break down our practice. It is of great importance that we should see that we are right in these respects, and nothing is of greater importance than that we should understand correctly the sympathies of particular parts with the general system, and the necessity of not being so minute specialists as not to discover the interests we have in the whole system. It is important that we should have a perfect understanding with our patients and make them feel that we do understand and sympathize with them, and are prepared to discover the cause of

their suffering. If they have this confidence, they will not be likely to change about to others for relief.

The matter comes back to us with quite as much force as to our patients, in its relation to our office-habits, our own dietetics, and physical constitution. We are subjecting ourselves to this very thing; as a profession we are very subject to neuralgia, and will remain so if we do not correct our habits. Shakspeare has been quoted by Dr. McQuillen as saying that the beetle that we tread upon feels a pang as great as when a giant dies. But Shakspeare made the assertion without examining into the laws of nature. The horse with his broken leg does not suffer as much as a man would. A man would not stump about and enjoy his food.

Dr. Barker. He would for a time, and I have seen it. Until reaction set in he would do so, and the horse would not feed longer than that. The injury produces anæsthesia of the main trunk for the time being. If a train of cars should take a man's legs off, I believe he would feel no pain, nor would he feel their loss for some hours. The force of this argument about differing sensibilities is not apparent. You may have a very small animal very highly organized; whereas in the earth-worm you have a very low scale of organization. It does not depend so much on the size of the animal.

Dr. McDonnell. The point is in a difference in the nervous pain suffered, and not in the difference of organization, and no class should understand this better than the dental profession, because they have it exhibited every day in their practice. One patient suffers agony, while the next in the same operation suffers little or no pain. It depends not upon the size of the animal, but upon the nervous organization.

Dr. Buckingham. We should be thoroughly acquainted with the apparatus on which we work; hence the importance of thorough anatomical and physiological knowledge. Dentistry must take in the general system as well as medicine, and he who does not understand the general principles of physiology and pathology is not competent to practice dentistry. If a man has a fine gold watch he will not send it to a tinker; yet a man will send his child to the greatest ignoramus in the country if only he makes pretensions. We shall never make any progress until we make the people understand the importance of this matter. We have a disadvantage in the practice of dentistry. If we put in a bad filling everybody will see it, while in the practice of medicine if a man gives a wrong dose it is soon forgotten, and if the patient dies so much the better for the doctor. We must do good work, and we must pay particular attention to the organism, for upon that depends our treatment. We cannot tell why our operations will produce more pain in one person than in another, except to refer it to difference in organization. We cannot tell how the sensation of pain produced

in a nerve by heat and cold is carried to the brain. Motion is the great source of all action and of all feeling. Sound produces motion upon the tympanum, and that impression is conveyed to the brain; but there we stop. We cannot tell how the sensation of light is conveyed by the optic nerve to the brain. It is necessary to have vibrations to the extent of four hundred and twenty millions of millions in a second before you can have the effect of white light upon the retina. There is a motion through every cell, every molecule in the body; they are working harmoniously to produce a certain effect, and in case there is abnormal action it will result in pain. We do not know anything at all about it; we can only trace its effects.

Dr. Smith. The diagnosis of these cases is the most important thing that may occupy us as dentists. This is the point where medicine is connected with dental surgery. Every man who expects to be a diagnostician of these cases must certainly understand the fundamental principles of anatomy, physiology, and pathology. We frequently meet with patients who can scarcely bear the idea of pain, and it requires a good surgeon to control his patients. By combining kindness with firmness we shall succeed, where otherwise we should be entirely confounded. He (the speaker) had had a case where the nerve of a diseased tooth had had a peculiar pathological bearing upon the optic nerve, producing partial amaurosis of the left eye. Physicians and oculists can make mistakes, and in this case the oculist made a terrible mistake in diagnosis; his prescription had no effect upon the sight. An examination showed the pulp of a second superior molar to be in a dried and shriveled condition, without vitality. Exostosis of the roots produces reflex action upon other parts, and why should it not? In this case the operation performed restored the sight, and the patient can now see as well as ever. Such diseases are not common, but we should all study up the causes that bear upon them.

Dr. Peirce said he wished to add his testimony to the fact that the presence of gum over the teeth may cause neuralgia. He had had a number of cases where neuralgia, and even limited paralysis, had occurred from the presence of gum over a molar tooth. It was true not merely of the deciduous teeth, but also emphatically of the permanent. In the wisdom-teeth it is most frequent; they are located in the angle of the jaw, and the calcification goes on and impinges upon the pulp.

Dr. Barker. In many cases neuralgia arises from absorption of the alveolar process, and the formation of scar-tissue and the pinching of the terminal branches of the nerve. These are extremely difficult cases to treat. There is nothing you can do except to make incisions, in order to break up, as it were, the attachments which bind these terminal branches, and even this will not always do. Prof. Gross recommends the severe operation of cutting down and dissecting off the remaining

portions of the yellow elastic tissue, and also to some extent slitting through the periosteum. Even this operation is not always successful.

Subject passed.

CAPPING PULPS.

Dr. J. S. King, of Pittsburgh, read a paper upon this subject, of which the following is an abstract:

The paper alluded to the fact that the treatment of pulps of teeth when exposed had been attempted in various ways with varying success. It was the purpose of the writer to state a method which had been remarkably successful in his hands since its first adoption,—so much so that he had come to regard the operation of capping as one of the plain and simple ones of minor surgery. A dentist who has succeeded in one case can do so in any number. Some who have written upon this subject have fallen into an error in claiming that the operator should be controlled in his treatment by considerations arising from general pathological symptoms; that his first duty is to note these, and to proceed to change them by proper remedies. Suppose the case to be one of malaria or of anæmia: the conditions require much time for the accomplishment of a radical cure, and during that time partial or entire disintegration of all the diseased pulps and teeth might occur. The result of the writer's experience was that pulps are more amenable to immediate local treatment than to any circumlocutory method. In all cases when dissolution of the pulp has not set in, it is the duty of the practitioner to proceed at once to local treatment, regardless of systemic conditions, and to cover the exposed point with proper materials. His second duty may be to treat any unfavorable constitutional symptoms.

Some five years since the writer had made an experiment in what was at that time an untried method of treating an exposed and painful pulp, and with such success that it had been continued since. The method is as follows: The cavity is first cleansed of all foreign substances; if the pulp is painful, wood-creasote or dilute carbolic acid is applied to relieve it. The cavity is shaped for the retention of the gold filling, laceration of the pulp being avoided. Occasionally it may be desirable to deplete it. The cavity is then wiped with creasote and the capping proceeded with. The materials for this are wood-creasote, oxide of zinc, and liquid chloride of zinc. The creasote is mixed with the oxide of zinc into a stiff paste, and carefully placed upon the point of exposure and gently pressed down with a pellet of cotton. This covering should not extend much beyond the exposure. The oxychloride of zinc is then mixed into a soft paste and the cavity filled with it; and when it hardens sufficiently, a gold filling may be inserted. In chronic cases this should be deferred until time has proved the suc-

cess of the operation. If inflammation should remain unsubdued, it may be necessary to remove the capping and wipe again with creasote, which will result almost universally in preserving the pulp. But if the operation of capping chance to be performed an hour or two too late, success need not be expected. It is not believed by the writer that the success of capping pulps with any material is generally due to a formation of secondary dentine; he regards this as a thing of rare occurrence, and, except in rare cases, as a pathological rather than physiological condition.

Discussion.

Dr. Flowers said that he was under obligations to Dr. King for the first instruction he had had in regard to this operation, some seven or eight years ago. Since that time he had given a great deal of attention to avoiding pain in filling, and, to encourage the patient, had put in many temporary fillings, especially for children, which would last from one month to two years, till they became of an age when the teeth could be properly filled. He recognized the importance of the treatment of congested pulps, and the capping of sensitive dentine. In a case that he recollected, he had removed the filling and punctured the pulp till it bled, cauterized it with carbolic acid, poulticed it with slippery-elm and oil of cloves, afterwards capping the pulp and filling with gold, this treatment resulting in perfect success. For the last year he had given a great deal of attention to pulps that had been congested, with a good deal of success, though he had lost some cases that had gone too far. In excavating sensitive dentine he had for years used, with great success, a piece of heated pumice-stone placed in the cavity for a few moments, and repeated if necessary.

Dr. Cressinger. The process described by Dr. King is of great importance. He had followed it for five years, and had kept a record of his cases, and out of seventy-five that he had capped he had lost three. He always instructs his patients to return at the first symptom of pain after capping.

Dr. Templeton gave his testimony in favor of Dr. King's process. He had learned of it when first adopted by Dr. King, and had at once adopted it and followed it with a great deal of success.

Dr. Chupein said that the practice of Dr. Wardlaw, of Georgia, when the nerve was exposed, was to use chloroform or gutta-percha dissolved in chloroform. A small piece of punk dipped in this mixture is placed over the point of exposure, and prevents the subsequent application of oxychloride from attacking the pulp. He always used this mixture when he found a tooth sensitive to oxychloride.

Dr. Taft, of Cincinnati, first spoke in reference to the law recently passed in Pennsylvania in relation to the practice of dentistry, bringing con-

gratulations from Ohio, where such a law had been in operation for several years, and had operated immensely to the benefit of the profession. This legislation constituted a new bond of union between the profession of the different States.

The subject of capping pulps is of the greatest importance. He regards the method detailed by Dr. King as in the main a very good one, but he hardly seems to give the systemic conditions a notice at all. He (Dr. King) proceeds about the same in every case, except that he punctures the pulp when there is a highly inflamed condition. There are a great many things to be noted by the dentist in any operation, such as the peculiarities of his patients and himself. We cannot take cases as they come, and treat them all alike. In some cases pulps may be exposed for a great length of time and retain vitality; in some a restoration and recuperation of tissue will take place, which would not occur with others. He had followed the practice of Dr. King for five or six years, —he could not say with unvarying success, but in a great measure it had been so,—but he had found it necessary to discriminate closely in the cases treated. Depletion is not always possible; if breaking down of tissue has commenced there will be a destruction of the pulp, and it will be better to follow other methods. There is an almost infinite variety of susceptibility, and we must take that into account. Dr. King has been very successful, and he may mislead us unless we pay close attention to the cases. Too much pressure must be avoided; that is an important point. There are malarious influences in Ohio, where it would be impossible for a good operator to cap pulps with any hopes of success at all.

Dr. Barker spoke of the necessity of discrimination in the selection of cases for this operation; in many it would be utterly futile, particularly in certain localities. In Philadelphia, he believed, his fellow-practitioners agree that it is unsuccessful in a majority of cases, though performed with care. It is due to some influence not understood. He differed with Dr. King in some of his positions in regard to calcific deposit. We have not always success when we think we have it. In one patient's mouth that he could call to mind, there is not a living pulp, and yet no man here could detect a dead pulp. The fact that the patient does not come back, and does not say anything about it, does not prove success. There are some cases in which you can remove a living pulp without much pain; in these cases capping with simply a piece of paper will save the pulp; but when there is a scrofulous diathesis it cannot be done. The first thing which we are advised to do with an exposed pulp is to saturate it with creasote. What for? If the pulp has not been wounded, we have done a very useless thing; we have formed a pellicle, if you please, of the carbolate of albumen; if that pellicle is retained for a certain length of time it will cause congestion

of the capillaries and the elaboration of formative material, which is just what we want, if it has been wounded. I do not consider puncturing a pulp good practice, because whenever a pulp is wounded we have a contraction of the opening, which must be closed by formative material, which goes on to organization, and if we are not careful it will go on to disorganization, which we want to avoid. He differs with Dr. Flowers *in toto*; the application of poultices to a congested pulp is reprehensible; a poultice causes a retrograde action, a breaking down of tissue. We do not want that; we want an increased flow of blood, and not stasis, or diminished circulation. The application of the ether-spray is better than a poultice. We are apt, in all these cases, to fill too soon with permanent materials.

Dr. Flowers said that he would like to explain that when a pulp is punctured it would suppurate, and a certain amount of pus would be formed, and his plan was in such a case to remove a portion of it until there is an osseous matter thrown out, cap it and fill over the cap letting the filling remain fourteen or fifteen days.

Dr. Barker. No one ever saw a poultice applied to a living pulp day after day, with suppuration following, which it surely would, and found the pulp alive under such circumstances. If this statement of Dr. Flowers's is correct, we might as well throw away pathology and physiology, for the formative material will be elaborated, and when the poultice is applied the result will be the breaking down and destruction of it.

Dr. Flowers. If you have a wound on another part of the body, do you not poultice it when suppuration takes place? That is my theory in regard to the pulp. The poultice is continued until the slough comes off. I have been carrying out this theory in my office for two years.

Dr. Buckingham did not think a mixture of oil of cloves and slippery-elm could be called a poultice, nor that the quantity of it that can be placed in a tooth could have the effect of a poultice. That effect is to keep the parts relaxed and allow nature to go on with the reparative process. Oil of cloves is antiseptic. It is a misapprehension of terms. What Dr. Flowers calls a poultice is called by others simply a dressing. There is not much difference in the practice. The creasote is what acts; the oxide of zinc simply gives it a body, and holds it there. Dr. Flowers is entitled to credit for using the oxide of zinc. The question is, Does creasote form a protection, so that healthy tissue is formed? Why should not the pulp become reorganized into tissue? If arsenic is applied to a pulp and we do not remove the pulp for a time, it will become sensitive again; its life will be restored. If we can save pulps by these means, it is much better than destroying them. It was once thought that pulps once exposed must be destroyed; now we know that in some cases they can be saved; but we must discriminate in the cases. Under certain circumstances a deposit of dentine will take place. You cannot

suppose that the sensitive, living tissue of the pulp would come in contact with oxide of zinc and remain in a healthy condition. It may be in an apparently healthy condition, and remain so for a long time, and tolerate the material next to it, but changes of temperature or of life may at any time set up inflammation.

Dr. Stellwagen facetiously said he wanted to show Drs. Barker, Buckingham, and Taft what a mistake they have made; Dr. Barker "goes for" our two great Josses, the biggest Josses we have in the profession; one is Joss Carbolic Acid, and the other is Joss Gold. If he takes carbolic acid out of the right hand of dentistry and gold out of the left, what is to become of dentistry? To be successful as a dentist, you must wipe out with carbolic acid and fill with gold! Is he going to break these great Josses right before our eyes? Another gentleman tells us that he puts poultices in teeth; the difference between his practice and mine is the difference between the names poultice and dressing. Cotton is a vegetable fiber,—so is slippery-elm. The difference between them is simply the difference between cotton and slippery-elm.

Dr. Barker did not care whose Joss was broken; we have made too great a Joss out of carbolic acid, and there has been a great deal of injury done with it; it is nothing more or less than an irritant, very good when you want an irritant, but bad when you don't.

Dr. Stellwagen. The doctor (Barker) has endeavored to break this Joss for ten years, but he cannot do it. It is like everything else which is taken hold of by the human mind; you cannot put down carbolic acid. He says it is a good thing in the right place, but it is a good thing in every place. There are some pulps in this community that can be capped with brickbats and be as comfortable as any pulps, and there are others that cannot be capped with a feather without giving trouble. There are times when the whole human economy is in a peculiar condition, and we must remember that a tooth-pulp is but a part of the human system. Sometimes a scratch will produce erysipelas. He had had a pulp himself that he ought to have had extracted and buried; it was just dancing in his tooth; if he had gone to some of our friends, they would have said that the pulp was of more importance to him than his bodily comfort,—whole nights of sleep are not as important as that. There are some of our patients who are perfectly free from irritable nerves; there are others whom a grain of sand on the skin annoys.

Dr. Kingsbury, of Philadelphia. What are the rational indications for capping pulps? It is evidently necessary only where the caries has proceeded until the pulp is entirely exposed, or where there is a very thin covering of dentine. The operation is indicated only when the constitution of the patient is such as to indicate a good degree of vitality, when there is not a highly developed nervous organization, and where

a congested condition of the pulp has not existed. In such cases, not to mention those where severe pain has existed, the proper treatment would be extirpation rather than preservation. Where the patient has not suffered from the exposure, the treatment would be to cleanse and syringe the cavity with tepid water, and then use a combination of salicylic acid and oil of cloves. This is prepared by adding to oil of cloves enough salicylic acid to make it of a thin creamy consistency, and to apply it on a little cotton, sealing it over and allowing it to remain a day or two. He does not approve of long-continued treatment of cases of this kind. He then makes an application of creamy oxychloride of zinc, not making much pressure until the hardening has commenced; then increasing the pressure laterally so as to give it density. If he fears that there is danger of congestion, either of the pulp or the alveolar membrane, he makes an application of a saturated solution of aconite around the neck of the tooth and over the roots. It must be used with the greatest care, as it is a powerful poison. The tincture of iodine is one of the best applications for astringing the parts around the tooth and preventing congestion. In treating these cases, much depends upon the condition and diathesis of the patient. Is satisfied, from ocular demonstration, that in a great proportion of successful cases a deposit of osseous tissue takes place; could recall one in which the pulp was punctured twenty-five years ago, and then covered with tin-foil, and is still alive. There is no reason why this should not occur. The pulp is a dentiferous organ, the calciferous vessels are there, and it seems plain that after the application of creasote there is first a slight congestion, followed by a deposit of lymph, which becomes organized by a mysterious process of nature, and finally becomes solid bone. Sometimes, however, there is an action resembling atrophy, which removes the thin layer of dentine, and then after a lapse of time it becomes irritated, inflamed, and death ensues.

Food.

Dr. T. F. Chupein read a paper upon this subject. The writer alluded to the fact that many in our profession adhere to the opinion that the chalky consistency exhibited by so many of the teeth we are called upon to treat, is owing to the lack of mineral elements in the food found upon our tables. The writer considered that this position is refuted by evidence to the contrary. One member of a family will have hard, dense teeth, another just the reverse; while both are fed at the same table and eat the same food. Two similar trees planted in the same soil will thrive alike; why should not two persons, apparently subjected to the same influences, do the same? It cannot be the food, since this is alike in both cases; it cannot be the lack of mineral elements, for many, if not all, the exhalations throw off mineral elements,

thus indicating that nature has more of these than she can appropriate. Nature never wastes anything, and we may infer that the food offered is sufficient for both bone and muscle; but the artificial lives we lead prevent her from appropriating the elements in the best manner. A correction of the evil must be looked for in a proper assimilation of the food. One person will properly appropriate all the ingredients of the food, while another will not. It is believed that the cause of this is difference in occupation, together with some other causes. In a practice of over twenty years at the South, the writer had carefully observed the teeth and habits of both the colored and the white population. It is certainly not the case that the negroes of the cities (however it may be in the country) have fine teeth. It is also found that the males and females of the negro population differ in this respect; the men, who are mostly engaged in out-door occupations, which give them plenty of exercise, air, and sunlight, have far better teeth than the females, who are kept in-doors, and debarred from all these things. This is the case not only with the negroes, but with the whites. Some statistics, kept for some years by the writer, had shown that the dental operations performed for females are largely in excess of those performed for males; and in nearly every case where the latter demanded dental services, they were men engaged in in-door and sedentary employments. All of these, both whites and negroes, were fed on the same food,—that ordinarily furnished in the market. It seemed plain that the lack of proper assimilation is induced by occupation. Disposition or mood has much to do with digestion and assimilation; the cheerful and gay will digest better than those who are gloomy and morose. Other causes tend to the decay of the teeth, which may be classed under the head of violations of nature. The taking of nearly boiling coffee, succeeded by iced water; the improper mastication of the food, washed down in great lumps by gulps of liquids, giving the stomach too much and the teeth too little to do, results in indigestion and impure blood, by which not only the teeth but the whole system suffers. Frequent drinking during the meal dilutes the gastric juices; the want of cheerful conversation at meals, the constant nibbling of food between meals; the disposition to avoid hard food, and the living on mush, stews, soups, and soft food; all these promote the loss of the teeth by decay or tartar. We have a confirmation of this view in the condition of swill-fed cows, which was recorded some years since in Frank Leslie's illustrated paper. The teeth are intended to chew hard substances, as is evidenced by their nature and density; the enamel being the hardest of all animal substances. Had we been intended to live on soft food, we should have been edentulous, as is the new-born infant, whose stomach can only digest liquids. The writer did not desire to uphold the popular "milk-white bread;" he believed in preserving the natural

elements of the cereals as God gives them to us, and not in changing them to suit the popular prejudice; yet he was indisposed to admit that to this cause alone could be ascribed the want of density of the teeth. Nature likes to choose her materials, and we should not limit her to an ill-supplied table; but for all this, the writer believed that if more fresh air, sunlight, and muscular effort were indulged in, men and women would thrive better, and have better teeth, even on poor food, than if these were denied and the food was the very best. The general health is impaired by these violations of nature. There is no fear that a revolution will be accomplished so suddenly as to deprive us of our calling, for it will, if ever accomplished, take years to effect, and the world may then get on as it did before, without dentists, while other occupations will be indicated for us.

Discussion.

Dr. Barker said that the best men who read papers present something that he had to go against *in toto*, which was unpleasant to him, but truth is involved in the discussion. He most heartily opposed certain positions of the paper; they are not borne out by experience and good judgment. It is a fallacy to suppose that two trees subjected to the same influences will both thrive alike; it is possible to conceive of it, but it is not the law. We all have certain inherited peculiarities, which stick to us, notwithstanding every contrary influence. Of two children fed at the same table, and with the same quantities of the same food, one will thrive and the other will be delicate. The cause is the lack of appropriative power on the part of one of the children. We have all seen children that were born weak and delicate develop, under favorable circumstances, into hearty, robust men, notwithstanding unfavorable hereditary influences. Therefore he wished to oppose the theory that we are not to encourage the use of certain kinds of food.

For the last few years, he had said to his patients that if they wished to prevent the decay of the teeth, there was but one way, and that was to see that the child had food containing certain elements, which must and would be appropriated, even when there is a defective appropriative apparatus. This must be commenced at the beginning of pregnancy; encourage the mother in the use of food rich in phosphates; encourage the use of the lacto-phosphates; see to it that the child is born with appropriative power, and where that is present you have nothing to do but to give the food. He disagreed with the paper in regard to the necessity for sunlight; men have been born in the bowels of the earth, and have reared children, without ever having seen the light of day,—proving that life may be transmitted from generation to generation without the aid of sunlight. He agreed with

much that had been said in the paper about the preparation of the food in the mouth, but he disagreed with the position that taking large quantities of water diluted the gastric juice and retarded digestion, and also with the idea that hot or cold liquids in any manner produced decay, or had any influence upon the teeth. The enamel is so organized that we cannot have any local influences produced by changes of temperature such as this. A pulp might be congested by this means, but enamel could not be changed. This question of food is receiving a great deal of attention at the hands of medical men, and they are doing all they can to encourage the use of those articles in which the natural properties of the grain are maintained,—that which goes to make the bones. The system cannot possibly be built up unless the elements of which it is composed are taken into it. In the back streets you will find scores of children with crooked legs and rickets; the cause is as simple as daylight: the mother deprived the child of the breast-milk, which contains phosphates and carbonates to build up the bones. He had sometimes likened teeth to servants; there might be just enough food upon the table for the family and friends, but the servants are obliged to take an inferior quality,—the remainder. The teeth are exactly in that condition; there is no great quantity of blood flowing to them; their organization is low, and hence they have to take a small quantity of nutritive material in proportion to their wants, and so we have defective nutrition and broken-down teeth.

Dr. Wade, of Iowa, said he had recommended Graham flour and Graham bread, but many people could not get it or could not eat it because of the irritation it produced. We have now a remedy for this in the "Attrition flour," which is made from white wheat, and the whole of the kernel is contained in it; the outer portions, or hull, being ground up fine by a new process. This can be obtained in Chicago at seven dollars and fifty cents per barrel.

Dr. McDonnell did not think that Dr. Barker differed materially from the essayist; they agreed with regard to the peculiarities of the system, but Dr. Chupein goes further, and calls attention to exercise and air. As dentists, we ought to understand the importance of these things; we stand at our chairs all day, and it is not surprising that we lose our appetite. A man in the country will drink several cups of coffee and eat some pounds of pork and digest it, while a man with sedentary habits, who has not had air and exercise, may be made sick at the very sight of pork. The males of a family have better teeth than the females, because they are out-doors, while the latter are indoors; counter-jumpers, tailors, and men living in two-by-four rooms, have poor teeth.

Dr. Barker said that he had had an opportunity of examining the

teeth of fifty Arapahoe and Cheyenne Indians not long since, and there was not a particle of decay in any of them. The reason is that they live upon a certain article of food, which is meat, and nothing else; they had not mixed with civilization. This food is rich in phosphates, and the eating of it caused a socket-motion of the teeth, and that is a matter of the utmost importance; it tends to cause a certain amount of congestion of the socket, and an increase in the quantity of nutrient material sent to the tooth, and that is the reason these Indians have undecayed teeth. Dr. Darby tells us that in Egypt he saw thousands upon thousands of skulls, and no evidence of dental decay in any of them; the reason was that they lived upon certain articles of food which prevented decay. He (the speaker) is an evolutionist, and believes that we are favorably advancing from a lower to a higher organization; therefore it is of the highest importance that we make use of our teeth. Let the children chew something, if only a piece of leather. He believed chewing gum to be a good thing, and defended it on honest principles; it will cause congestion of the periosteum, and increased nutrition. The highest order of civilization is productive of the lowest physical order, and must always be so, and if we ever become edentulous, it will be because of civilization. We are fast approaching that condition; the first and second bicuspids and the first molar are changing: there is a retrograde metamorphosis taking place.

Dr. Dixon wished to draw attention to the importance of teeth having antagonizers; frequently we find that teeth which have not, will in time drop out for no other reason than want of usefulness. We often make mistakes in attempting to save all teeth; those that have antagonists should be saved, but those that have not may be extracted.

CONNECTICUT VALLEY DENTAL SOCIETY.

THIS society held its thirteenth annual meeting at Springfield, Massachusetts, October 17th and 18th. Officers elected for the ensuing year are as follows:

President.—J. F. Adams, Worcester, Massachusetts.

First Vice-President.—L. Noble, Springfield, Massachusetts.

Second Vice-President.—L. C. Taylor, Hartford, Connecticut.

Secretary.—C. T. Stockwell, Springfield, Massachusetts.

Treasurer.—N. Morgan, Springfield, Massachusetts.

Executive Committee.—C. A. Brackett, Newport, Rhode Island; J. S. Hurlbut, Springfield, Massachusetts; J. J. Anderson, Springfield, Massachusetts.

C. T. STOCKWELL,
Secretary.

PENNSYLVANIA STATE EXAMINING BOARD.

THE Board of Examiners appointed at the last meeting of the Pennsylvania State Dental Society, in compliance with the law regulating the practice of dentistry in Pennsylvania, will be in session in Pittsburgh on Thursday and Friday, the 28th and 29th of December, 1876. All applicants for examination will report in person to Dr. J. S. King, 71 Sixth Avenue, Pittsburgh, but are requested to address at once the chairman of the Board, Dr. C. N. Peirce, 1617 Green Street, Philadelphia.

CORRECTION.

IN the discussion upon Dr. Magill's paper, entitled "Conservatism in Dentistry," published in the DENTAL COSMOS for October, I did not speak in opposition to the conservation (preservation) of the natural teeth, but took exceptions to *conservatism in methods* of practice.

"Conservatism" signifies "*Opposition to change*" (from the old to new methods); hence I took exception to 'conservatism in dentistry,' and not to the conservation of the natural organs.

MARSHALL H. WEBB.

PUBLISHER'S NOTICE.

CLOSE OF THE VOLUME.

THIS number completes the eighteenth volume of the DENTAL COSMOS. The first number of the nineteenth volume will be published January 1st, 1877; succeeding numbers on the first of each month following.

Beyond the statement that the coming volume will appear in new type and remain under the editorship of Dr. J. W. White, we have no promises to make concerning it. Its probable value in the future must be estimated by its record in the past. Its unequaled and steadily-increasing subscription list throughout the English-speaking world justifies the belief that it is supplying the needs of dental practitioners.

We ask the favor of prompt subscriptions and renewals, that we may determine the size of the edition.

SAMUEL S. WHITE.

PERISCOPE.

SYPHILITIC TEETH.—The adjourned discussion on this subject was renewed. Mr. Cartwright expressed his regret that Mr. Salter was not present to open the discussion, especially as the cause of his absence was indisposition. The secretary read a letter from Mr. Salter, in which he regretted his inability to be present. He believed that Mr. Salter coincided with Mr. Hutchinson as to the existence of a peculiar type of tooth as the result of hereditary syphilis; but thought that more proofs were required to support the theory that mercury had any special action upon the teeth generally, or upon the six-year-old molars in particular. In those cases which Mr. Hutchinson had published, there was not always direct proof that mercury had been administered. Again, Mr. Salter thought that the cases were rare in which that mineral produced stomatitis in children, and that these malformed teeth appeared in people of all nations, whether it was used or not. His opinion was that there was nothing in the appearance of the so-termed mercurial teeth to indicate that it was the result of other influences than depressed and arrested nutrition during development. At least sixty-five per cent. of the first molars showed symptoms of decay at an early age. Mr. Jonathan Hutchinson, after expressing his regret at Mr. Salter's absence, said that he did not think that the teeth which he called "mercurial" teeth were invariably owing to the effects of mercury. The malformation might be due to a variety of causes occurring in infancy. Constitutional influences might result in some congestion within the alveolar process, the capsule of the tooth being similarly affected. But he believed that mercury was the cause of the great majority of the examples of misformed teeth under consideration. The reason why the first permanent molar was the most liable to decay was probably that it was the first of the second set to calcify, and, therefore, was the most likely to suffer in the event of the child's health being decayed. As to the special characteristics of the mercurial tooth, the absence of enamel on the surface of the first four molar teeth was by far the most important. These teeth never escaped; and, if the others were affected, the central incisors, the lateral incisors, and the canines were most frequently so, the enamel being deficient. Syphilitic teeth were defective in size and shape, showing symptoms of general atrophy, whilst mercurial teeth showed few symptoms of malformation beyond the absence of enamel, a rugged condition of the denuded dentine being left. Mercurial teeth were invariably found in connection with lamellar cataract, the occurrence of which was subsequent to birth. In lamellar cataract, there was always a history of convulsions in early life; and, as a rule, mercury was largely administered in such conditions. He believed that lamellar cataract was connected with convulsions, and quoted several cases to prove that, where it existed when mercury was not given, the teeth were unaffected; but that, when it had been administered for convulsions, the cataract and the imperfectly developed molars existed together. Mr. Coleman asked whether Mr. Hutchinson had seen any tendency to transmission from parent to child of the peculiarly formed teeth of which he had been speaking. Mr. Hamilton Cartwright asked whether Mr. Hutchinson thought that, in the so-termed stomatitic and mercurial teeth, it was necessary that there should be actual ulceration of the mucous mem-

brane, and whether it might be owing to the effects of a special virus upon the developing structures; or did he think that actual stomatitis must be present. Mr. Hutchinson said that, in that peculiar form of "craggy" tooth in which enamel was present, though imperfect, he frequently found it to be an hereditary condition; but he did not find this to be the case in the stomatitic or mercurial tooth in which no enamel was present. He did not think that ulceration need necessarily be present, but that congestion and inflammation of the parts connected with the development of the teeth was a quite sufficient cause. It would be interesting to discover what effects the salivation of a pregnant mother might have upon the tissues of the child. Mr. W. Hardy related a case of a child, who had been the subject of interstitial keratitis, in which the central incisor on one side only was of that conformation which Mr. Hutchinson thought to be diagnostic of syphilis. The corresponding tooth on the other side showed no signs of mal-development. There was no history of specific disease. Mr. Warrington Haward had examined the teeth of many children in the factory districts of Lancashire. Among many hundred children, he only found one case of inherited syphilis, and he did not see a single example of notched teeth. He had never seen a case of the typically notched permanent incisors in which the patient had not a history of hereditary syphilis. With regard to the so-termed "mercurial" teeth, he found them very prevalent in the North, but he felt inclined rather to ascribe them to sweetmeats than to mercury, as the people there were able to afford many luxuries. The president was inclined to agree with Mr. Haward, that sugar might have something to do with the early decay of the first molar teeth; though he thought that there was some difference between the merely decayed tooth and the stomatitic tooth. Mr. Henry Lee thought that to make syphilitic and mercurial teeth diagnostic of one particular condition was opposed to all the principles of medicine. With regard to syphilis, there was no one symptom which could be held to be exclusively diagnostic of the disease. He had seen paralysis and tetanus from syphilitic disease of the brain; but to say that lockjaw was diagnostic of specific taint would be ridiculous. His impression was that so described syphilitic and mercurial teeth were the result of impaired nutrition, whether caused by syphilis, scrofula, or any other condition. Doubtless, the hereditary form of syphilis might cause mal-development of the teeth; but this was simply the result of imperfect nutrition, and he thought that these results might be transmitted to another generation. Whether this was so with mercurial teeth, he could not say. Mr. W. D. Napier expressed his gratification at finding that the opinions of Mr. Henry Lee, Mr. Francis Mason, and Mr. Risdon coincided with his own, and that that of Mr. Warrington Haward also tended toward the same conclusion. In answer to Dr. Drysdale's criticism, he justified the views that he himself held, as formed upon the basis of long personal experience; and to Mr. Coleman he pointed out that, by admitting several exceptions to the rule that had been laid down by certain physiologists for the determination of the existence of syphilitic taint, that gentleman had rather strengthened the arguments in favor of incredulity. Mr. Hamilton Cartwright's theory, that test-marks should not be looked for in teeth of the first dentition, because calcification took place *in utero*, he did not consider conclusive, so long as many congenital im-

perfections were acknowledged to be attributable to inherited syphilis. In reply to Mr. Jonathan Hutchinson, he said that it was his opinion that the difficulty of obtaining the previous history of the cases which Mr. Hutchinson would attribute to syphilitic taint, but which he himself believed to be more often the result of a combination of several inherited maladies, made the production of them or of illustrated casts, in most instances, wholly unprofitable; for which reason he had brought for inspection only one of the latter, and the blemish in this case might, he had every reason to believe, be attributed to a severe attack of scarlet fever in early life. He deprecated the acceptance of the theory that semilunar marks were a conclusive proof of inherited syphilis.—*Proceedings of Association of Surgeons practicing Dental Surgery, in British Medical Journal.*

DENTAL ANÆSTHETICS AND "DENTAL SURGEONS."—The explosion of feeling and remonstrance which has been produced by our remarks on this subject on the 27th ult. could not have occurred unless a formidable quantity of explosive material had existed in a condition to be easily fired by any casual spark that chanced to fall upon it. So much kinetic force implies the previous existence of at least an equivalent of potential energy. Our correspondents on either side need to be reminded of two series of facts,—the one relating to the history of the present controversy, the other to our consistent policy as an organ of medical opinion with regard to the specialty of dental surgery and the position of those by whom it is and ought to be practiced. We will not dwell on the first topic, as those of our readers who care to understand the occasion of our remarks on the 27th ult. may find the key to all we said, and can scarcely place an erroneous construction on the argument, if they will refer to the letter of Dr. Burney Yeo, which appeared on the 29th of April last, and which, apparently, some of our enthusiastic critics have not read. Dr. Yeo's case, or, at least, his complaint, clearly related to the use of anæsthetics by unqualified persons practicing dentistry. We condemned this, and we went further. We objected to the practice of "anæsthetists" administering "the gas" for unqualified dentists as unadvisable on many grounds. Dr. Burney Yeo referred to the "Association of Surgeons practicing Dental Surgery," and we repeated what we had said on many previous occasions, as to the wisdom of starting and the duty of supporting this new society on grounds ethical and prudential. We did not allude to the qualification in dentistry granted by the College of Surgeons in our remarks; as a matter of fact we had not that qualification in view. Our attitude with regard to the special diploma is unchanged. Twenty years ago we expressed an opinion that some such qualification was desirable, and the College of Surgeons was a fitting body to give it. We think so still. We made another observation twenty years ago which it may be worth while to recall. There were fears, when this special license was instituted, that its holders, not being also members of the College, would feel themselves aggrieved by not being placed on an equality with surgeons. We endeavored to show that while this inferiority of the L.D.S. must undoubtedly exist, it would be simply honest to acknowledge it, and vanity to strive for equality. It is strictly in accordance with this opinion that we warmly approve the combination of those who are surgeons first and dentists afterwards. We think now as we thought in 1865, that it is well such a qualification should

exist ; but, like the midwifery license, it should be taken after the membership. We do not say that none except members of the College of Surgeons ought to practice dentistry, but only those who are medically qualified can treat a case of tooth-disease all through. It is, in fact, much easier to understand an isolated specialty relating to the eye or ear than to the teeth. No part of the organism is more sensitive, more intimately connected with the general system, or so commonly affected sympathetically with other organs. It is almost impossible to conceive of an independent treatment of tooth-disease. All reforms are progressive. At one time bone-setting was a specialty, and the bone-setters and barber bleeders were opposed to the movement which first introduced educated men into their craft, and then raised it to the dignity of an art culminating in a science. This is what time is doing for dentistry. The unqualified experts must not complain if they are crowded out, or the educated and diplomated dentists if they are gently persuaded to join the profession under whose college they now hold a special, and subordinate because limited, license.—*The Lancet*.

THE USE OF AROMATIC SULPHURIC ACID IN NECROSIS.—April 10th, 1875, Dr. A., of Worcester, requested the writer to remove the necrosed alveolar process of his wife's sister. She was of middle age, pale, thin, weak, anxious, and worn. She had suffered much with her teeth. Her upper right, middle, and two lateral incisors were found to be loose, and their lower edges hanging below the line of their fellows. There was a fungoid, spongy swelling over the front of the diseased process. When this was pressed pus freely exuded from several openings, and also from a softish, elastic swelling as large as a hazel-nut, situated at the dome of the hard palate inside the mouth. The loosened teeth could be freely moved in every direction with the thumb and fingers. The roots of the teeth distinctly grated against the sound alveolar process. There was a complete separation of the teeth and the bone. Dr. A. said that he had thought of using the aromatic sulphuric acid, but that the disease was so extensive and the separation so complete that he regarded it as useless to try to save the teeth in any way. It appeared to the consulter, however, while the surgical extirpation would be effective and justifiable, that if free incisions were made into the swollen and spongy gums there would be an evacuation of the contents of the dilated capillaries and abscesses; that a healthy action would be promoted by relieving this unnatural distention, and that the necrosed bone might be slowly removed by the stimulation of the aromatic sulphuric acid topically applied without destroying the teeth. It was thought that then the periosteum would lay down new bone in place of the old, and refasten the teeth in their old places. It was agreed to employ the following :

R.—Aromatic sulphuric acid, ʒj ;
Aque, ʒj.

By means of a half-ounce syringe supplied with a small ivory tip, one inch and a half long, and one-eighth inch in diameter, the acid solution was injected at first twice a day, and afterwards once a day. About two drachms were used at each injection. The syringe tip was deeply buried into the soft tissues through one of the openings. Pus would freely exude from the other openings, even from that in the top of the mouth after each injection.

Tonics were administered. A diet of animal food and unbolted wheat was rigidly maintained.

From the outset of this departure a marked improvement in the soft tissues occurred. But the teeth remained loose and dangling, and Dr. A. thought their recovery doubtful. It was resuggested that it would be an easy thing to remove them at any time if they did not reset, but that the process of replacing old with new bone was of necessity a slow one.

In about forty days the outer incisor became solidly fixed in its old site. Then the next incisor also tightened. The middle incisor tightened slowly. In November following it could be very slightly moved, but its edge was a little below the line of the other teeth. The other two incisors were as stiff as they ever were. A few spiculæ of bone were removed from the front of the alveolar process during the period of the treatment. In the mean time the general health of the patient improved greatly. She gained in weight, color, and strength. At the present time (July, 1876) she is entirely recovered.

We think it is reasonable to connect the result in this case with the means employed,—the acid, the tonics, and the food.

Dr. Atkinson, of New York, has reported some remarkable instances of cure of necrosis by this agent, used in its full strength, it is said. It hastens the disintegrating and separating processes, and at the same time destroys the germs of parasitic micrographic growths in the dead and dying bone. According to Dr. Atkinson, it does not act unhealthily upon sound tissues whose vital connections are unimpaired. No substances stand higher than the mineral acids as antiseptics and destroyers of bacteria, amœbæ, and vegetations of animal secretions. Were it not for their caustic effects they would long ago have supplanted carbolic acid.—*Ephraim Cutter, M.D., in Boston Medical and Surgical Journal.*

IMPERFECT MASTICATION AS A CAUSE OF DIARRHŒA.—Dr. A. W. Edis calls attention (*The Practitioner*, April, 1876) to what he justly considers a frequent cause of diarrhœa, viz., deficient mastication from defective or decayed teeth. It is also most certainly a most frequent cause of dyspepsia in various forms, and the only mode of relief for these ailments is by having adjusted properly in the mouth artificial teeth to assist in mastication.—*American Journal of the Medical Sciences.*

BOGUS DIPLOMAS.—Notwithstanding that the Legislature of Pennsylvania has annulled the charters of the colleges in Philadelphia which have been issuing bogus diplomas, and other legal measures have been taken to arrest their issue, it appears that this fraudulent business has not been entirely arrested. A large lot of such diplomas was recently received, it is said, at the custom-house in Philadelphia, from Liverpool, consigned to Dr. B. C. Buchanan, and has been seized as fraudulent. These diplomas are in blank. One set professes to be issued for attendance at the "University Hospital;" the other is that of the "Eclectic College of Pennsylvania," and has attached the signatures of certain professors.—*Medical News and Library.*

HINTS AND QUERIES.

WILL some one explain the cause of air-bubbles in celluloid on being worked? I use Heindsmann's heater, and have followed Dr. Jno. R. Watson's mode of working it, as described in the DENTAL COSMOS for June, 1876.—F. E. G., *Texas*.

HOW TO TAKE THE BITE.—The replies to George Dillon say, Do certain things and then "have the patient close the jaws." Now, the conundrum with me is how to *know* that the lower jaw is not thrown too far forward.—W. B. K., *Towanda, Pa.*

REPLY TO GEORGE DILLON, in the DENTAL COSMOS for July.—If the jaws of some of our patients were fixed like an articulating model, the task of getting the "bite" would not so often perplex. It really seems impossible for some folks to close the mouth twice alike, and the more they try the worse they get. Hence it is better, on the first trial at least, to "steal a march" on them—get the "bite" while we draw their attention in some other direction. We begin with the base-plates (which are most durable and certain if made of gutta-percha). Placing a rim of softened wax on the upper base-plate while on the cast, we insert this in the mouth. Adjust it so as to exhaust some of the air above it, holding it in place with the left hand, placing the right under the chin, requesting a closing of the mouth. Assisting the correct closing with the right, we press the lower maxilla into the softened rim of wax sufficiently so the lower cast can be inserted when removed from the mouth; but before removing, the center must be marked, and it may as well remain in the mouth a short time, while we stand back and see that the articulation is as nearly correct as possible. After adjusting on the articulating model, the incisors and bicusps of both sets are put on the base-plates with wax. The molars would be only a hindrance while trying in the mouth. If when placed in the mouth the articulation is good and the teeth accessible, the grinding may proceed, having due regard to the length and proper projection of the teeth. It is well to try in the mouth till we are satisfied all is right while grinding on the teeth. If, however, the bite is incorrect, generally the easiest way to improve it is to close the teeth while in the mouth as nearly correctly as possible, then plaster together with plaster of Paris the teeth and plates, and, if possible, remove from the mouth without separating the plates; readjust the articulating model, and proceed as before.

Much trouble is saved the dentist and patient when the finished sets are placed in the mouth, and two pieces of softened wax—of the size and shape of the third of the length of a cedar lead-pencil—be placed on the lower molars and bicusps on both sides of the mouth, so that when closed the incisors are visible, to see that the closing is correct; then press the projecting ends over the incisors, letting the wax harden a few moments, so that both cases can be taken out of the mouth without separating. By adjusting this on the articulating model, the cusps may be ground so as to articulate very satisfactorily. An easy way to tell where the cusps strike too much is to insert strips of paper and draw them out betwixt the teeth.—JOHN D. WINGATE, *Carbondale, Pa.*

REPLY TO GEORGE DILLON.—In the September number of the DENTAL COSMOS I notice several answers to the query, "How to best obtain the Articulation for an Upper and Lower Denture," and as my method seems to differ a little from those mentioned I will state it: Make the upper articulation all complete, remove to cold water, to harden the wax. Now prepare the lower case, and while the wax

is quite warm insert both into the mouth, letting the patient bite as near together as desirable for the length; the wax on the lower case being soft will yield, allowing it to adapt itself to the upper articulation, and at the same time insure a bearing of both plates to their places on the jaws. Now remove and trim the lower wax to conform in fullness to the upper articulation and the requirements of the mouth. Should the bite be found too long, let the patient bite again until the desired length is obtained. This method was brought to my notice nearly twenty years ago, and although it may be patent to many, still may be new to a few.—D. W. LEACH.

IN answer to the interrogatory of Dr. Geo. Dillon, in the July DENTAL COSMOS, I would suggest, from practical experience, that he build up a ridge on a well-fitted base plate a little higher than he wishes the teeth, allowing the patient to bite sufficiently hard to form an impression of the ends of the teeth in the wax. For full upper and lower set, the wax must be built up only to the desired height of the teeth.—R.

ANSWER TO "W.," IN OCTOBER NUMBER.—To prevent joints discoloring use none but good plaster. Let it get sufficiently hard, open your flasks, and, after removing all wax or base-plate, take a small instrument and put a drop of clean water in the joints, and then a small bit of fine plaster; the water will dissolve the plaster and it will run in the smallest opening. After drying, remove all surplus and heat in water, pack your rubber with very little surplus and good flood-gates, heat and bring together slowly, and I know you will have joints free from rubber.—D. BROS, *Kentucky*.

IN reply to W., who says it is a mortifying fact that joints of block teeth before vulcanizing are perfect, and when they come out of the flasks they often are open and black. I was much troubled in the same way until a remedy was found: Be careful to joint perfectly. After you remove the wax and the case is ready for packing, fill the joints with ordinary dry plaster, then saturate the plaster thoroughly with silex (liquid). Remedy No. 2: Mix German cement to the consistency of thick cream and apply to the joints. If you can command the time, let the case stand for about twelve hours after cementing. The result will be beautiful. Silex is very valuable for mending broken block teeth: put one or two drops on broken surface, press well together, and subject it to dry heat.—J. CLARK SCOTT, D.D.S., *Lancaster, O.*

OXYCHLORIDE OF ZINC.—Dr. Flagg, in the November number of the DENTAL COSMOS, referring to oxychloride of zinc as a capping for exposed pulps, makes use of the expression, "Hydrated oxychloride of zinc." Apparently Dr. Flagg means merely a further dilution of the solution of the chloride, which, for ordinary use, is about one part of chloride of zinc to six parts of water.

His application of the term "hydrated" is inaccurate, and calculated to mislead his readers. It is rather a common error to suppose that the simple admixture of water converts a substance into a hydrated compound. When water combines chemically with a substance it does so with great energy, the water is decomposed and heat is evolved.

Even water of crystallization, though entering into combination, is much less intimate than where a hydrate is formed; for example, we take $\text{CaSO}_4 + 2\text{H}_2\text{O}$, by simple calcination the two molecules of water can be entirely driven off.

KHO, caustic potassa, is an illustration of a hydrate, and cannot be decomposed by heat; showing that a hydrate is not merely a substance diluted with water. On the other hand, a solution of chloride of zinc, by evaporation, may

again easily be brought to the form of the original salt; thus showing that mere dilution does not alter it chemically.

The energy of the reaction which takes place when a hydrate is formed is well shown in the case of the potassium hydroxide, KHO. If one atom of the metal is brought in contact with one molecule of water, it decomposes the water, and, being a monad metal, it displaces only one atom of hydrogen, taking its place and forming a real hydrate thus:



It will here be seen that the atomicity of the metal has something to do with the resulting compound. And although certain metals allied to potassium may form hydrates by their anhydrous oxides uniting with water, as in the slaking of lime ($CaO + H_2O = CaH_2O_2$, calcium hydrate), yet in the case of zinc oxide combination with water does not take place, and zinc hydrate can only be obtained by a complicated process.—C. J. ESSIG.

REPLANTATION—TWO CASES IN PRACTICE.—*Case 1.* Miss Eva T—, age seventeen, consumptive diathesis, came to me in November, 1875, with an aching left superior first bicuspid. Posterior approximal cavity extending well up under the gum. On excavating I found pulp exposed and considerably inflamed. I at once instituted treatment and directed her when to call again. In a few days she was taken very sick from effects of a severe cold and exposure, continuing ill three or four weeks. Meanwhile, I was obliged to leave my office and practice for some two months. Upon my return, Miss T— called to see what I could do for her tooth. The arch being full, teeth regular and beautiful, it seemed almost a crime to suffer its entire loss. Having very little hope of successful treatment through the ordinary channels, I advised its extraction and replantation, to which she readily consented. Calling a few days after, about noon, I extracted the tooth, syringed out the alveolus with a solution of carbolic acid, iodine, and glycerin, leaving a tent of cotton saturated with the same in the alveolus; sent her away to school, and directed her to call as soon as dismissed. I then excavated thoroughly, drilling out the nerve-canal, from the apex, with my engine, and filling both root and crown with gold and polishing. I immersed tooth in warm water and awaited her return; which was delayed until fully six hours after extracting the tooth. Removed cotton from alveolus, syringed again with tepid water, and, after immersing root of tooth in the solution mentioned before, returned it to its socket with the forceps, pressing it well up. I had very little hope of success, considering the health of the patient and the length of time between extracting and replacing. It was very sore for a week, but the soreness gradually subsided, so that in ten days she could use it in mastication. It troubled her a very little at times for about six weeks, but at the present writing, and for seven months past, it has remained as sound and firm as any of its neighbors.

Case 2. In February last Miss Anna P—, a strong, healthy young lady, about eighteen years of age, came to ask me what I could do for her upper incisor teeth. Upon examination I found them badly decayed, and all filled with amalgam, done some four years ago by a neighboring dentist. I advised the removal of the disgusting black plugs and refilling with gold. I found also the right central badly abscessed. After removing amalgam and refilling the others with gold, I prepared to institute treatment of the abscessed tooth; but finding that she was to leave the city too soon for successful treatment, I advised extraction and replantation. Upon extracting I found apex of root partially absorbed and spongy; removing this, I proceeded exactly as before, excepting that I filled the crown

cavity with oxychloride instead of gold. Returned to socket in one hour and a half after extraction. This tooth became firm in about a week, and gave no further trouble. Upon her return to the city I removed os-artificial and inserted gold contour plug, the operation lasting about four hours and a half, and at the end of that time the tooth manifested no soreness whatever.—J. H. SPAULDING, Rochester, Minnesota.

IN an article in the September number of the DENTAL COSMOS, page 503, by Dr. A. H. Hilzheim, of Mississippi, entitled "Replantation of Superior Lateral Incisors," he describes the case as follows: "Face very much swollen, inflammation extending from lip up to and embracing the eye; tooth loose in its socket; adjoining central incisor loose, with every indication of abscess. Both teeth filled in approximal surfaces," etc. And then adds, "*that as there was no other alternative except to extract the tooth*, it occurred to him that this would be an excellent opportunity to try replantation." Now, if Dr. H. desired to experiment with "replanting teeth," and his patient did not object, I am satisfied, but am not willing that the statement I have underlined above should go forth without dispute. In the first place, I venture the assertion *that it was entirely unnecessary to extract the tooth*; and further, that from his description of the case the inflammation had not extended to suppuration, and doubtless the abscess which was forming could have been absorbed without even having a fistulous opening in the gum, although that would have been no objection in the subsequent treatment of the case. This could have been done by opening the tooth from the palatal surface, and removing the dead pulp with the "blood and pus" from that point, without so much as disturbing the fillings in the approximal surfaces. The treatment through the opening thus made, together with that necessary to reduce the inflammation in the soft tissues around and adjacent to the tooth, is very simple, and also very effectual, and would not only have saved his patient a great deal of suffering, but would have demonstrated to him that it is not necessary for a dentist to take a tooth out of the mouth to treat it any more than for a physician to remove a disordered stomach for the same purpose. I do not write this to censure Dr. H., but if he honestly thinks that there is "no other alternative but to extract such teeth," I can assure him that he is mistaken.—ROBERT M. REYNOLDS, D.D.S., New York.

"A SURE GUIDE FOR THOSE WORKING CELLULOID."—In the September number of the DENTAL COSMOS a correspondent under the above caption says, "Cut off from your plate until it is only a trifle heavier than twice the weight of your base-plate, and you will have just about the quantity needed," but does not state whether the base-plate should be made of wax or gutta-percha, or of both. That the same rule cannot apply indiscriminately to base-plates made either of wax or gutta-percha, or both of them combined in various proportions, is evident from the fact that the specific gravity of wax is 0.96, while that of the American Hard Rubber Company's prepared gutta-percha is 2.454. (See Professor Wildman's "Instructions in Vulcanite," p. 23.) By actual experiment I have found the specific gravity of celluloid to be nearly 1.35. Accepting these figures as correct, it would follow that when the base-plate is made of gutta-percha the celluloid mould should be reduced to two-thirds the weight of the base-plates,—when the base-plate is wax the mould should be reduced to one and two-fifths times the weight of the base-plate. This estimate makes no allowance for the necessary surplusage to insure perfect plates. As base-plates are often made of wax and gutta-percha in various proportions, or in combination with other substances, it will be necessary to ascertain the specific gravity of the base-plate, which can be done as follows:

Weigh the base-plate in water, and then out of water divide the weight out of water by the difference between the weight in and out of water, and the quotient will be the specific gravity. Find the specific gravity of the celluloid mould in the same manner. Divide the specific gravity of the mould by the specific gravity of the base-plate, and the quotient will be the weight of the mould required to exactly fill the space occupied by the base-plate. The weight of the base-plate will be the unit of the answer to the last division,—that is, if the answer is 1, then the weight of the mould should just equal that of the base-plate; if 2, it should be twice as heavy as the base-plate, etc. For practical use I think the measure by water, as recommended by Professor Wildman, in his "Instructions in Vulcanite," pages 21 and 22, is preferable to the above method.—C. EVERTS.

A SINGULAR CASE.—A few days since I was called upon by Mr. L——, a merchant of this place, a large plethoric-looking gentleman, who wished a tooth extracted—the first superior bicuspid. He said he was eating a piece of cheese after dinner, and that this tooth had burst with a report like a pop-gun, which was heard by all who were at the table. He further said that he had lost all his superior molars and three of the superior bicuspids in the same manner. I found the tooth was indeed split directly through between the cusps. I extracted it and found the pulp in a perfectly normal condition, and no decay whatever of the tooth. His teeth are of the dense yellow kind, and never decay.—J. S.

A HINT FOR MOULDING MODELING COMPOSITION.—First take a round tin top, such as usually comes on large blacking-boxes; then oil a cake of the modeling composition, which has never been used, and, after pouring a thin batter of plaster of Paris upon the side which contains the diagram of teeth, fill the tin top and press the cake into it down to the top of the rim. Allow this to harden, trim, remove the modeling composition, and you will have a beautiful matrix for use. To press, immerse the mould in water to prevent the material from adhering, and, after having softened your old material in hot water, place in the mould a sufficient quantity (taking care to have the side next the mould as smooth as possible), and press with a piece of smooth board. There will be no danger of cracking the mould, as this is prevented by the tin top. The cake on being removed will be of the same size and have the appearance of a new one. Wax may also be manipulated in the same way, but it is apt to look flaky.—F. F. DREW, D.D.S.

IN using amalgam near gold fillings, first coat the gold with sandarac varnish; after it becomes dry there will be no danger of pieces of amalgam becoming attached to it (the gold) during the operation.—D. M. C.

A PECULIAR case of deformity came to the writer's notice recently,—a girl, fifteen years of age, suffering from *cleft velum*, which was split open from the edge of the palatal bone down to and through the uvula. In speaking, the effort resulted through the nose, as in cleft palate. The act of deglutition, as observed with the mouth open, seemed difficult. There was lateral closure of the edges of the opening up to within half an inch of the hard palate; this formed an ellipse, and no effort of the child could close it. I think the deformity occurred from causes as follows: Previous to her birth, perhaps four months, her mother had an impression in plaster of Paris taken of the upper jaw. Either from the excessive sensitiveness of the velum, or from too large a quantity of plaster used by the dentist, violent retching resulted during and for some time after the operation. The child all through infancy and somewhat during early childhood suffered from spasms of retching. Whether the rupture of the velum occurred during foetal life or during a spasm in infancy is not known.—A. M. ROSS, Hartford, Connecticut.

*John Ross - 12th
5-Mar. edge*

